Compaq ProLiant ML330 Generation 2 Server

Maintenance and Service Guide

Part Number 234832-003

November 2002 (Third Edition)

Product Version: 2.0

This document provides detailed instructions for maintenance and service personnel. It includes removal and replacement procedures, spare parts information, and an overview of diagnostic tools for the Compaq ProLiant ML330 Generation 2 server.

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About This Guide

This maintenance and service guide is a troubleshooting guide that can be used for reference when servicing the Compaq ProLiant ML330 Generation 2 server.

WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs can create conditions that are hazardous.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings:

WARNING: Text set off in this manner indicates that failure to follow directions in the warning can result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions can result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Important Safety Information

Before installing this product, read the *Important Safety Information* document provided.

Compaq Technician Notes

WARNING: Only authorized technicians trained by Compaq should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module-level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, do not exceed the level of repairs specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create conditions that are hazardous.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- **Disconnect power from the system by unplugging all power cords from the power supplies.**
- **Do not disable the power cord grounding plug. The grounding plug is an important safety feature.**
- **Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.**

CAUTION: To properly ventilate the system, you must provide at least 7.6 cm (3.0 in) of clearance at the front and back of the server.

CAUTION: The computer is designed to be electrically grounded (earthed). To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

NOTE: Any indications of component replacement or printed wiring board modifications may void any warranty.

Where to Go for Additional Help

In addition to this guide, the following information sources are available:

- User documentation
- *Compaq Service Quick Reference Guide*
- Service training guides
- Compaq service advisories and bulletins
- Compaq *QuickFind*™ information services
- *Compaq Insight Manager*™ software

For additional copies, visit the Compaq website:

www.compaq.com

Integrated Management Log

The server includes an integrated, nonvolatile management log that contains fault and management information. The contents of the Integrated Management Log (IML) can be viewed with Compaq Insight Manager.

Telephone Numbers

For the name of your nearest Compaq authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.

For Compaq technical support:

- In the United States and Canada, call 1-800-OK COMPAQ.
- For Compaq technical support phone numbers outside the United States and Canada, visit the Compaq website:

  www.compaq.com

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Illustrated Parts Catalog

This chapter provides the illustrated parts breakdown and spare parts lists for the Compaq *ProLiant*™ ML330 Generation 2 server with an Intel Pentium III processor and a 133-MHz system bus. See Figure 1-1 and Table 1-1 for the names of referenced spare parts.

Mechanical Parts Exploded View

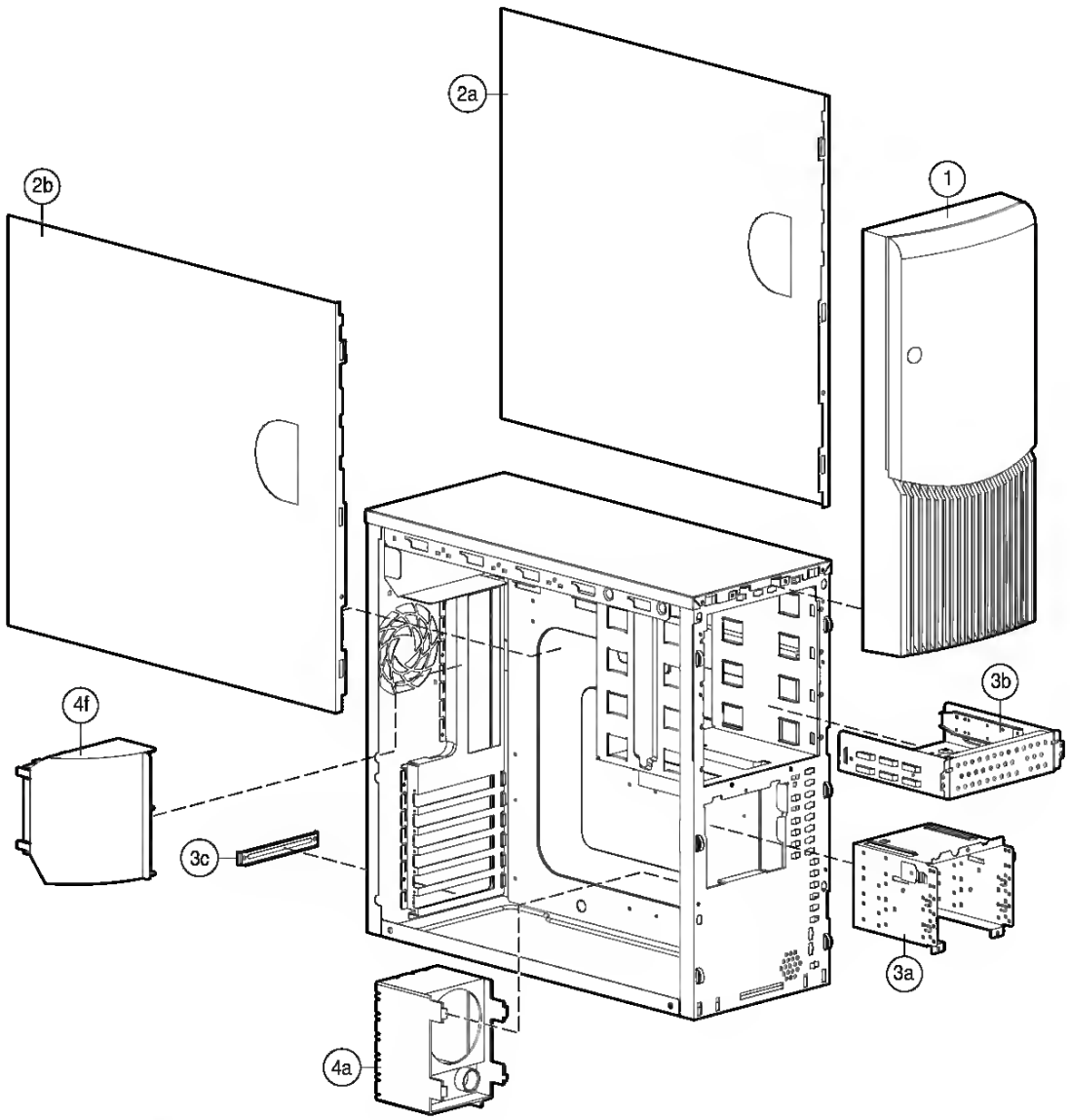

Figure 1-1: Mechanical parts exploded view

Mechanical Spare Parts List

Table 1-1: Table 1-1 Mechanical Spare Parts List

Item	Description	Spare Part Number
	Chassis	
1	Front bezel	241466-001
2	Panel access left/right	176606-001
	a) Hood panel (right)	
	b) Access panel (left)	
	Miscellaneous	
3	Hardware kit	176616-001
	a) Hard drive compartment	
	b) Removable drive tray	
	c) Expansion board knockout	
4	Miscellaneous plastics kit	176617-001
	a) Expansion board guide	
	b) Rubber bumpers*	
	c) Removable media bezel blank*	
	d) Cable clips*	
	e) Miscellaneous clamps*	
	f) Internal fan baffle	

*Not shown

System Components Exploded View (ATA Model)

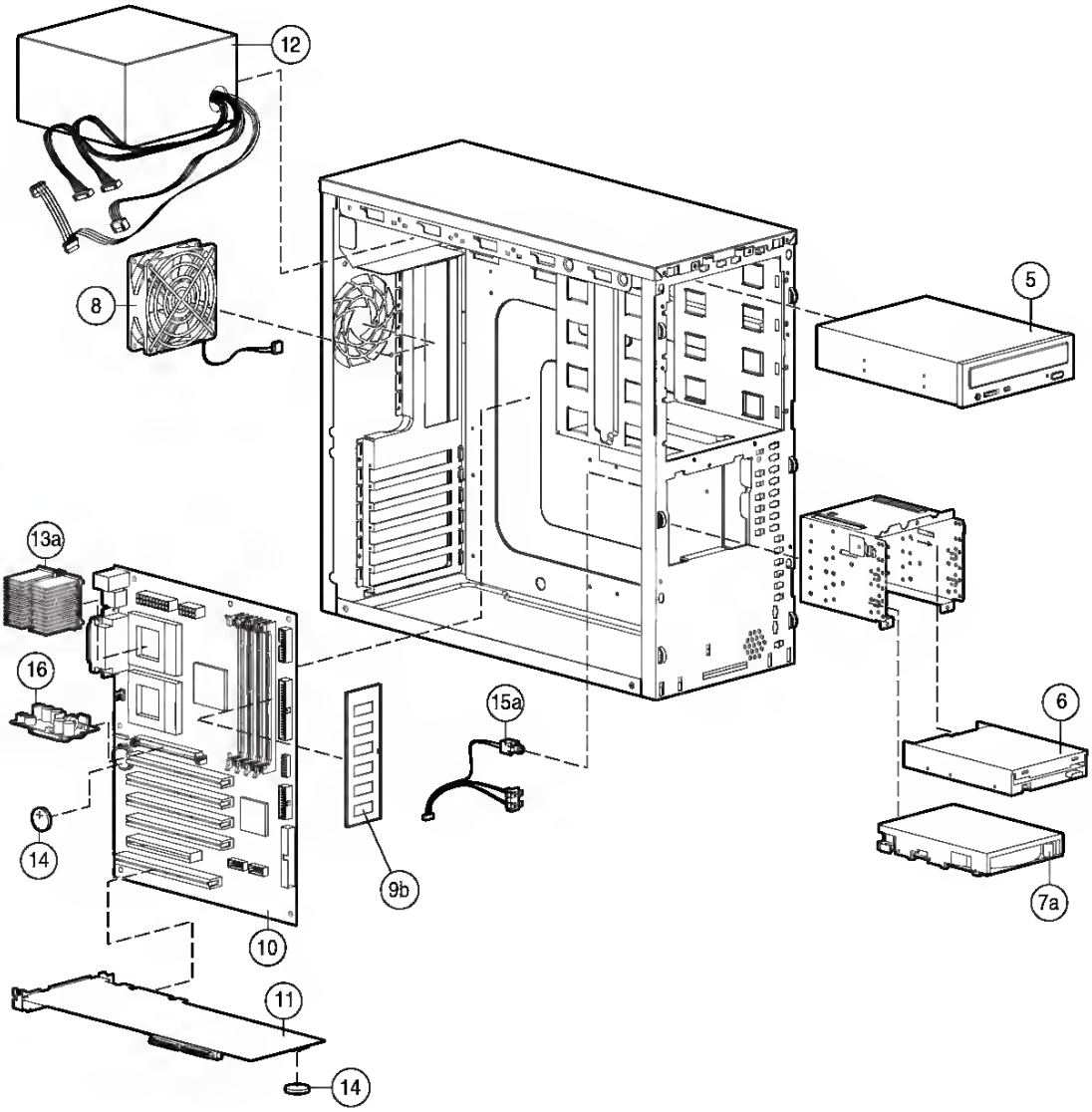

Figure 1-2: System components exploded view (ATA model)

System Components Exploded View (SCSI Model)

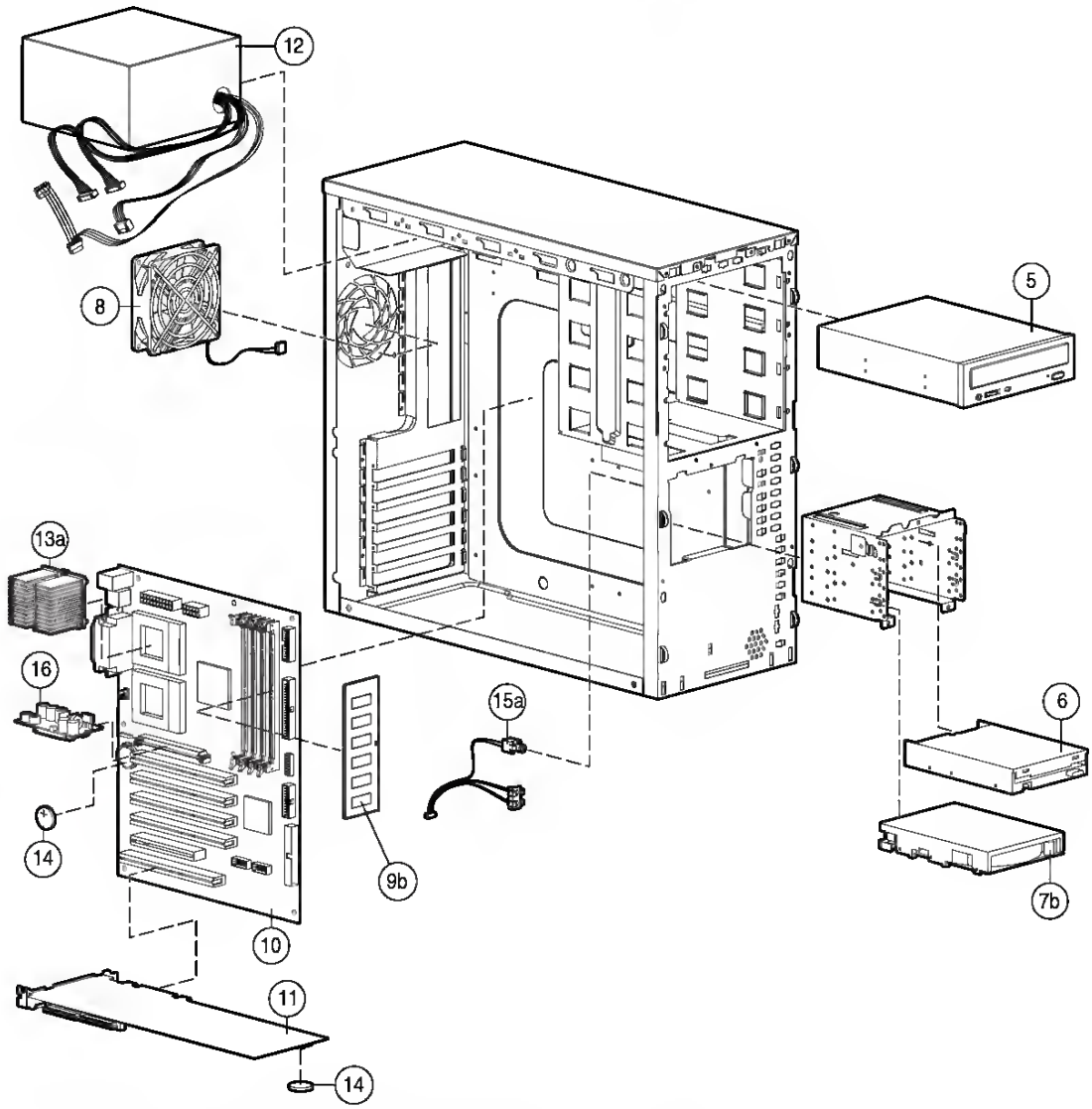

Figure 1-3: System components exploded view (SCSI model)

System Components Spare Parts List

Table 1-2: System Components Spare Parts List

Item	Description	Spare Part Number
	Mass Storage Devices	
5	IDE CD-ROM drive 40X	233408-001
6	Diskette drive	233409-001
7	Hard drive	
	a) 20-GB ATA hard drive (ATA model)	230699-001
	b) 18.2-GB Wide Ultra3 hard drive, 10K RPM (SCSI model)	152191-001
	System Components	
8	Fan	241487-001
9	PC 133-MHz ECC Registered SDRAM DIMM	
	a) 64-MB*	159225-001
	b) 128-MB	159228-001 164278-001
	c) 256-MB*	159304-001 159377-001
	d) 512-MB*	159227-001 177628-001
	e) 1-GB*	163902-001
	Boards	
10	System board	241485-001
11	Server Feature Board	245246-001 (ATA model) 241489-001 (SCSI model)
	Power	
12	CE Mark-compliant power supply, 300 W	216108-001
13	Pentium III processor	
	a) 1-GHz/133 with heatsink (heatsink is black)	245245-001
	b) 1.13-GHz/133 with heatsink (heatsink is silver)*	239324-001
	c) 1.26-GHz/133 with heatsink*	230991-001
	d) 1.40-GHz/133 with heatsink*	259594-001
14	CR2032 lithium battery	234556-001
15	Power cable kit	176619-001
	a) Power button assembly	

continued

Table 1-2: System Components Spare Parts List *continued*

Item	Description	Spare Part Number
	b) Power shield cable*	
	c) Power extension cable*	
16	Processor Power Module (PPM)	228506-001
	Miscellaneous	
17	Enhanced keyboard*	244000-001
	a) European keyboard – UK*	244000-031
	b) European keyboard – GR*	244000-041
	c) European keyboard – FR*	244000-051
	d) Spacesaver keyboard – JP*	244000-291
18	Signal cable kit*	253826-001
	a) IDE ribbon cable assembly*	
	b) Diskette drive cable assembly*	
	c) ATA cable assembly*	
19	Ultra3 SCSI cable*	176607-001
20	Rack enabling kit*	249443-001
21	Country kit*	245247-001
22	Return kit*	176621-001
23	Maintenance and service guide*	176670-001

*Not shown

2

Removal and Replacement Procedures

This chapter provides subassembly/module-level removal and replacement procedures for the Compaq ProLiant ML330 Generation 2 server. Run the diagnostics program to be sure that all components operate properly.

To service the server, you might need the following:

- Torx T-15 screwdriver
- Phillips screwdriver
- Diagnostics software from the Compaq *SmartStart*™ for Servers software CD

Electrostatic Discharge Information

An electrostatic discharge (ESD) can damage static-sensitive devices or microcircuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage, observe the following precautions:

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Cover workstations with approved static-dissipating material. Use a wrist strap connected to the work surface, and properly grounded (earthed) tools and equipment.
- Keep work area free of nonconductive materials, such as ordinary plastic assembly aids and foam packing.
- Make sure that you are always properly grounded when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.
- Always place drives with the Printed Circuit Board (PCB) assembly-side down.
- Use conductive field service tools.

Symbols on Equipment

These symbols may be located on equipment in areas where hazardous conditions may exist.

WARNING: This symbol, in conjunction with any of the following symbols, indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed.

WARNING: This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.

WARNING: This symbol indicates the presence of electric shock hazards. The area contains no user- or field-serviceable parts. Do not open for any reason.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.

WARNING: This symbol, on an RJ-45 receptacle, indicates a network interface connection.

WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

WARNING: This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching it.

WARNING: These symbols, on power supplies or systems, indicate that the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.

WARNING: This symbol indicates that the component exceeds the recommended weight for one individual to safely handle.

Weight in kg
Weight in lb

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

Preparation Procedures

WARNING: Only authorized technicians trained by Compaq should attempt to repair this equipment. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. Refer to "Electrostatic Discharge Information" earlier in this chapter for more information.

Powering Down the Server

Before beginning any removal and replacement procedure:

CAUTION: Failure to follow these directions could result in damage to equipment or loss of information.

1. Back up your server data and record configuration information.
2. Shut down the operating system as directed in your operating system instructions.
3. If necessary, power down the server by pressing the power button on the front of the server.

NOTE: To completely remove all power from the server, you must disconnect the power cord. The front panel power button may not completely shut down power to the server.

4. Disconnect and remove the AC power cord from the AC outlet, and then from the server.

WARNING: To reduce the risk of injury from electric shock or damage to the equipment when installing hardware, make sure that the power to the server is turned off. Remove any AC power cords to completely disconnect power from the system. The front panel power button may not completely remove power to the server.

5. Disconnect any other external equipment connections to the server.

Server Warnings and Precautions

WARNING: To reduce the risk of injury from electric shock, disconnect all power cords to completely remove power from the system.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes, and keeps the system in operation during a power failure.

CAUTION: The server must always be operated with system unit covers on. Proper cooling is not achieved when the system unit covers are removed.

Front Bezel

WARNING: To reduce the risk of personal injury and to prevent damage to the equipment, before removing the front bezel, be sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

To remove the front bezel:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Pull up on the latch at the bottom of the front bezel, applying enough pressure to release the latch from the chassis (1).
3. Swing the bezel upward, and then slide it out and away from the chassis (2). You may need to exert a small amount of force to release the bezel from the chassis.

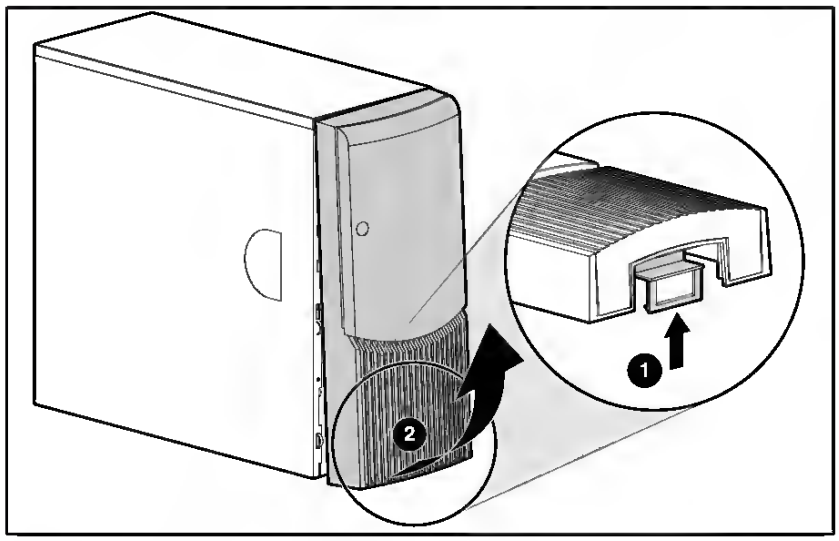

Figure 2-1: Removing the front bezel

NOTE: When replacing the front bezel, ensure that the top hinge points are properly placed in the chassis before rotating the front bezel back into its original position.

To replace the front bezel, reverse steps 2 and 3.

Access Panel

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

WARNING: To reduce the risk of personal injury and to prevent damage to the equipment or loss of information, before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

CAUTION: Do not operate the server while the access panel is removed. This panel is an integral part of the cooling system, and removing the panel while the system is running may adversely affect data integrity.

To remove the access panel:

1. Perform the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the screw located on the left side of the front chassis (1).
4. Slide the access panel forward, pull from the top of the access panel, and then lift the panel from the chassis (2).

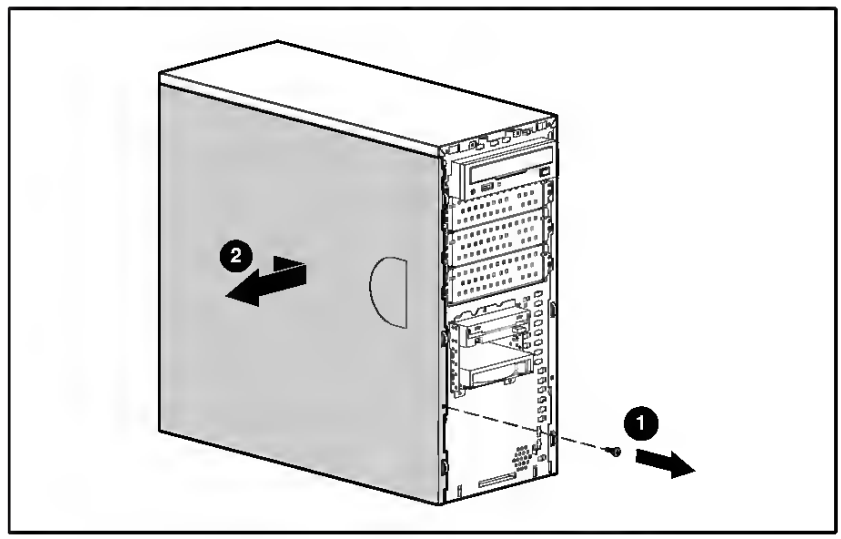

Figure 2-2: Removing the access panel

NOTE: Turn the access panel over to locate the system configuration label. This label provides information about the system board of the server.

To replace the access panel, reverse steps 2 through 4.

Storage Devices

The server ships standard with seven drive bays, five of which are available. Table 2-1 shows the corresponding drive bay descriptions.

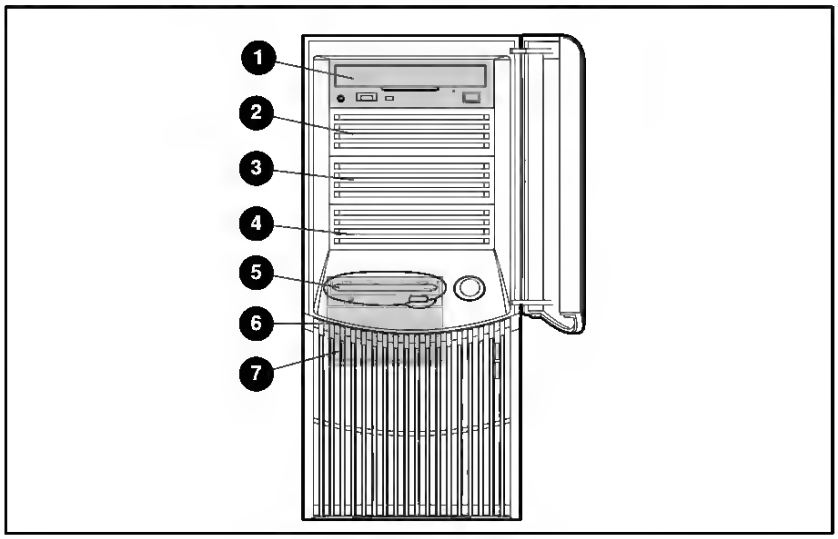

Figure 2-3: Storage device drive bay locations

Table 2-1: Storage Device Drive Bay Description

Drive Position	Description
1	5.25-inch x 1.6-inch IDE CD-ROM drive bay
2	5.25-inch x 1.6-inch available removable media drive bay
3	5.25-inch x 1.6-inch available removable media drive bay
4	5.25-inch x 1.6-inch available removable media drive bay
5	3.5-inch x 1-inch 1.44-MB diskette drive bay
6	3.5-inch x 1-inch hard drive bay
7	3.5-inch x 1-inch hard drive bay

Bezel Blanks

To remove a bezel blank from the front bezel:

WARNING: To reduce the risk of personal injury and to prevent damage to the equipment, before removing the front bezel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded AC outlet.

NOTE: It is not necessary to remove a bezel blank when installing a hard drive into a removable media bay.

1. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
2. On the back of the front bezel, pinch the tabs on each end of the bezel blank toward each other (1), and then push the bezel blank through the front bezel (2).

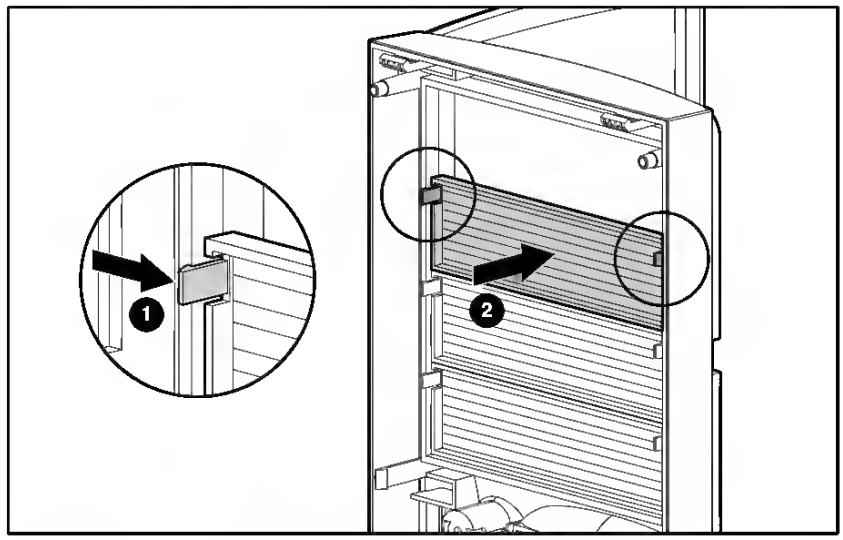

Figure 2-4: Removing a bezel blank

To replace a bezel blank, reverse steps 1 and 2.

Internal Fan Baffle

To remove the internal fan baffle:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Loosen the shipping screw that secures the baffle to the fan, if necessary (1).
5. Slide the baffle out and away from the chassis (2).

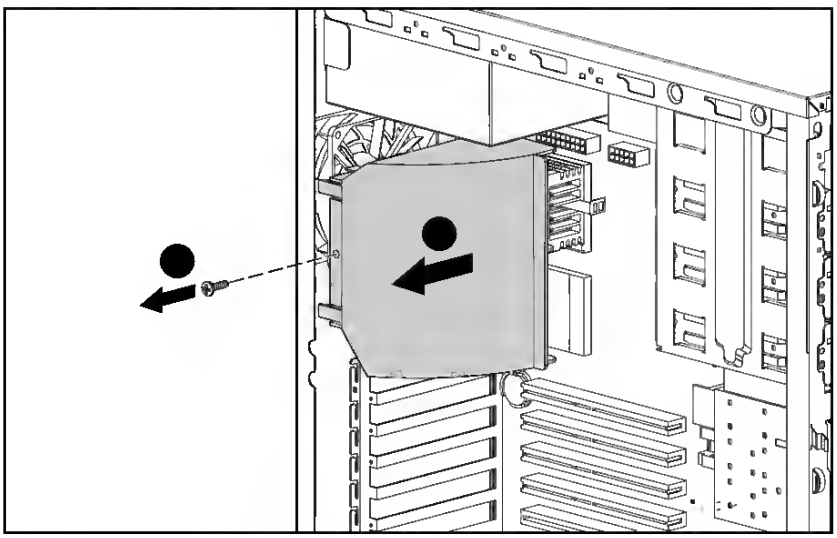

Figure 2-5: Removing the internal fan baffle

To replace the internal fan baffle, reverse steps 2 through 5.

Fan

To remove the fan:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Remove the internal fan baffle. Refer to "Internal Fan Baffle" earlier in this chapter.
5. Disconnect the fan power cable from the system board fan connector.

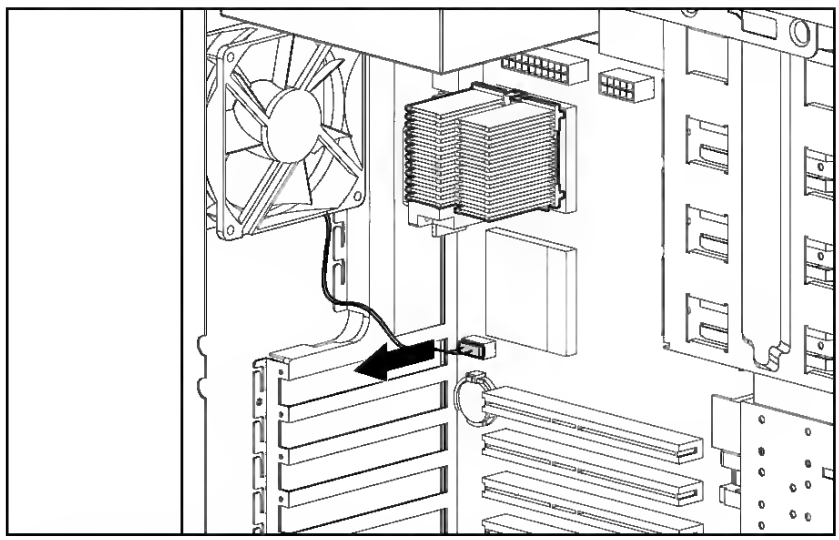

Figure 2-6: Disconnecting the fan power cable from the system board fan connector

6. Use a Torx screwdriver to remove the four mounting screws at the rear of the server (1).
7. Pull the fan out and away from the chassis (2).

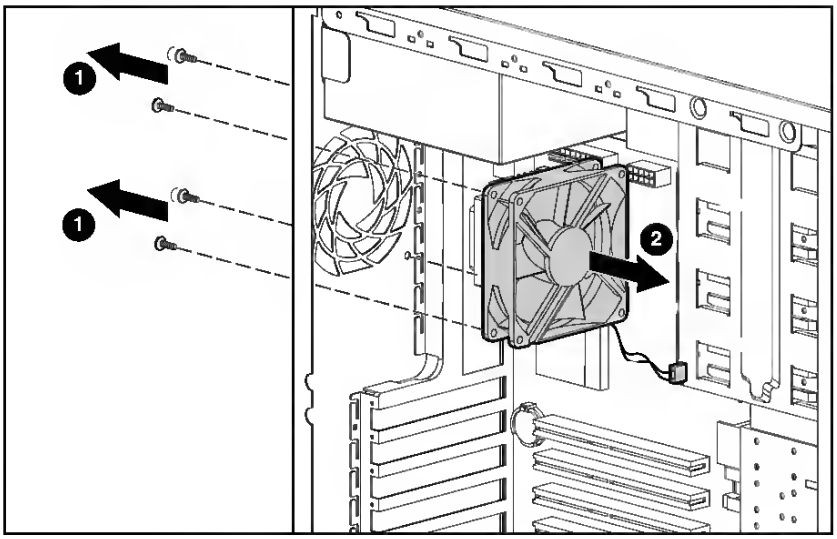

Figure 2-7: Removing the fan

To replace the fan, reverse steps 2 through 7.

Cable Routing Diagrams

Figure 2-8 through 2-10, show cable routing diagrams for the server.

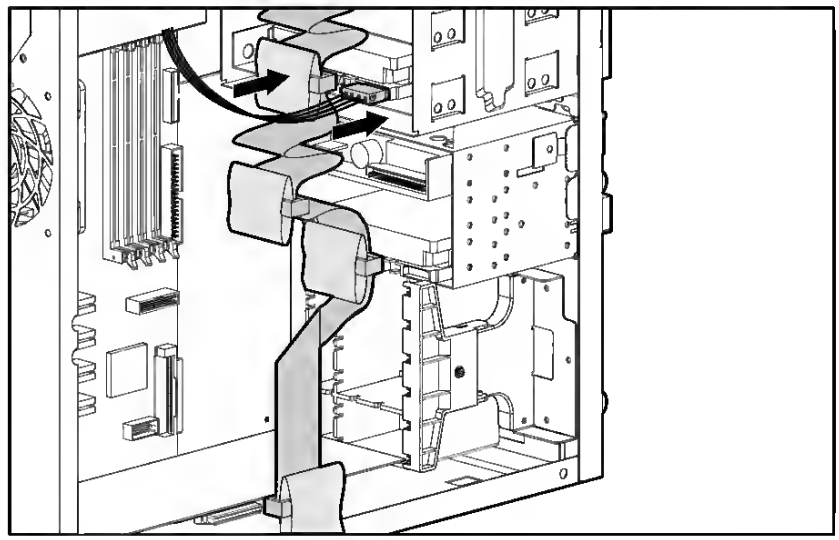

Figure 2-8: SCSI cable routing

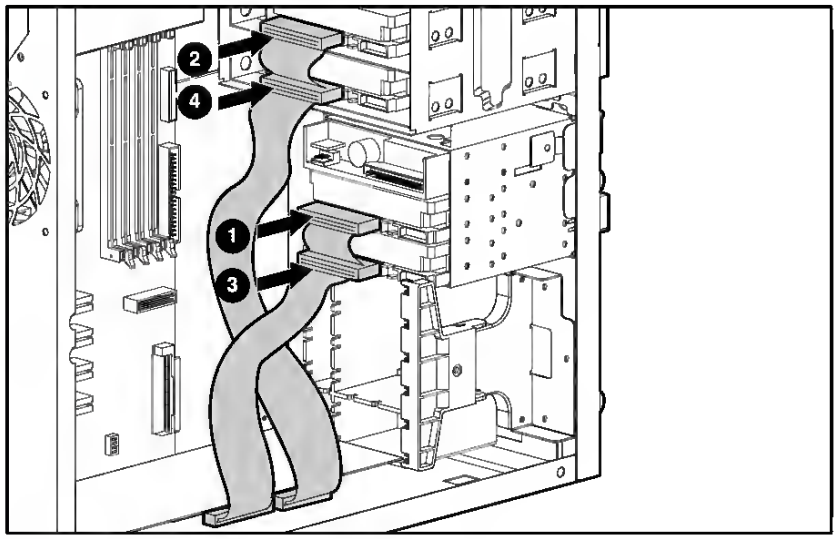

Figure 2-9: ATA cable routing

Table 2-2: ATA Cabling Routing

Item	Channel/Cable	Cable Connector	Drive Location
1	Primary	Device 0	Hard drive bay 2
2	Secondary	Device 0	Media bay 3
3	Primary	Device 1	Hard drive bay 3
4	Secondary	Device 1	Media bay 4

ATAPI Tape Drive Cable Routing

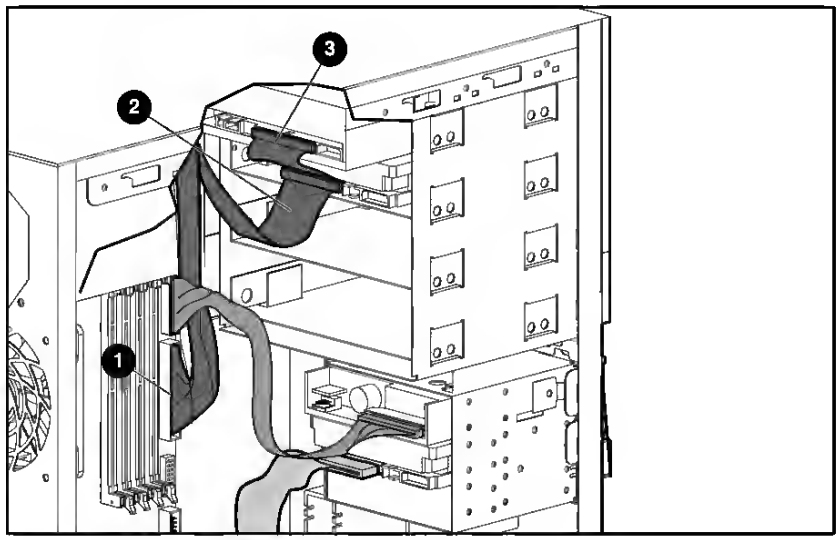

Figure 2-10: ATAPI tape drive cable routing

Table 2-3: ATAPI Tape Cabling

Item	Connector
1	Integrated primary IDE channel
2	Device 1
3	Device 0

Drive Tray

To remove a drive tray from a removable media bay:

WARNING: To reduce the risk of personal injury and to prevent damage to the equipment, before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

NOTE: The drive trays in the removable media bays can be used to mount internal 3.5-inch hard drives. The rails mounted inside the drive trays can be removed and used to mount other devices in the removable media bays.

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Using a Torx screwdriver, remove the screws on each side of the drive tray (1), and then gently slide the drive tray out of the front of the chassis (2).

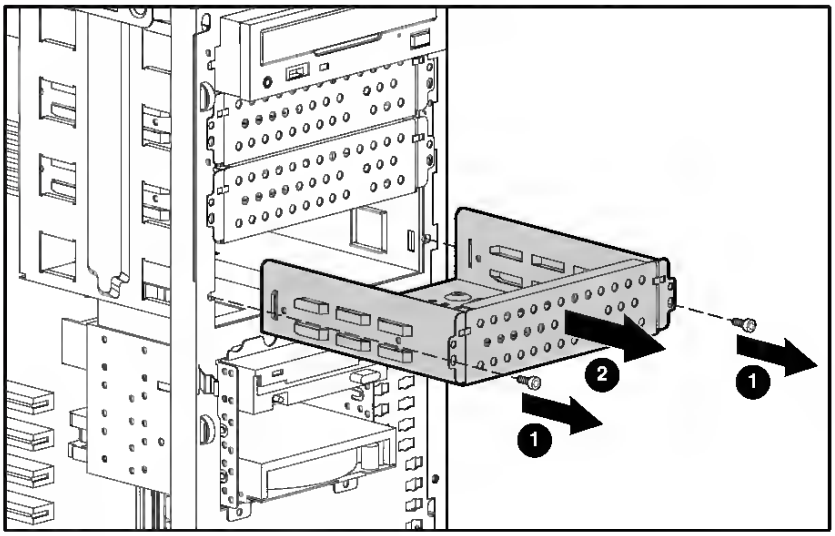

Figure 2-11: Removing a drive tray

To replace a drive tray, reverse steps 2 through 4.

Removing a Hard Drive Compartment

To remove a hard drive compartment:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel door. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Disconnect the power and data cables from the back of all devices in the hard drive compartment being removed.

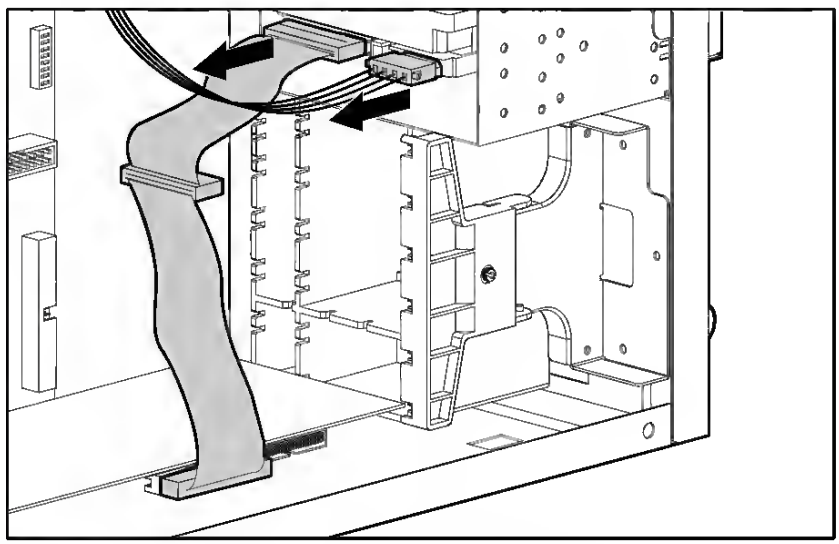

Figure 2-12: Disconnecting power and data cables from the ATA hard drive compartment

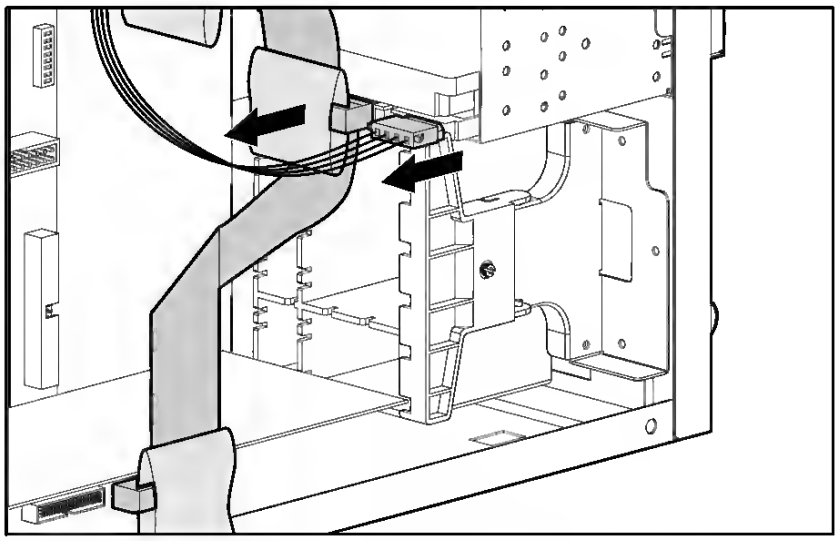

Figure 2-13: Disconnecting power and data cables from the SCSI hard drive compartment

5. Remove the three shipping screws (1), press the tabs on each side of the drive compartment (2), and then pull the drive compartment from the chassis (3).

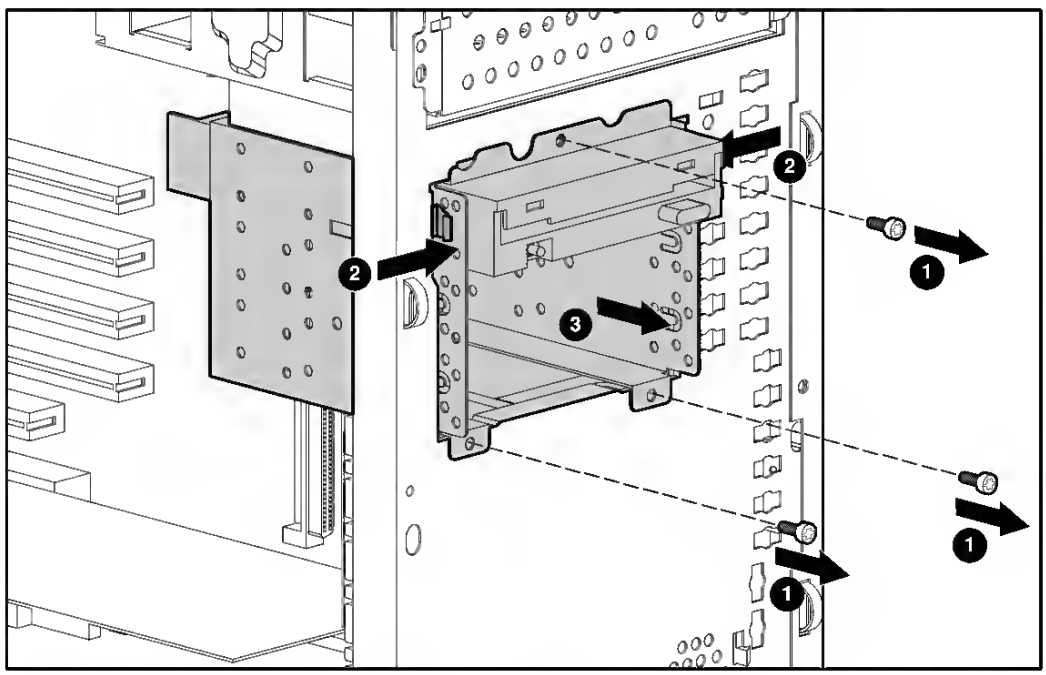

Figure 2-14: Removing a hard drive compartment

To replace a hard drive compartment, reverse steps 2 through 5.

Hard Drives

To remove a hard drive from the hard drive compartment:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Disconnect the power and data cables from the back of all devices in the hard drive compartment.
5. Remove the hard drive compartment. Refer to "Removing a Hard Drive Compartment" earlier in this chapter.
6. Using a Phillips screwdriver, remove the two screws on each side of the drive to be removed (1), and then gently pull the drive out of the drive bay (2).

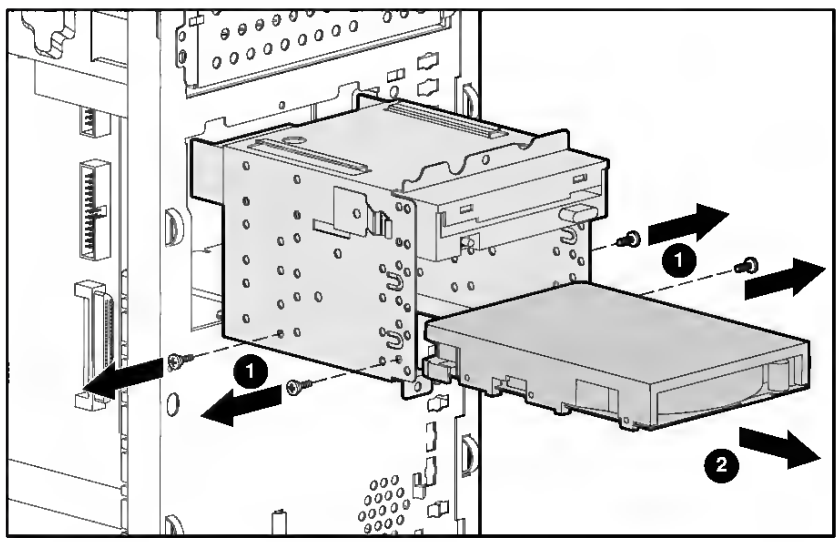

Figure 2-15: Removing a hard drive

To replace the hard drive, reverse steps 2 through 6.

Drive Failure Scenarios

IMPORTANT: This section applies only to ATA models of the server.

When a drive fails:

- Compaq Insight Manager notifies you of the drive failure.
- If applicable to your operating system, the RAID status icon changes from green to red to indicate that there is a problem. The icon is represented as a round figure wearing sunglasses and is located in the tray bar at the lower right of your screen.

IMPORTANT: Some operating systems do not display the RAID status icon or the icon may be displayed differently.

The following sections provide instructions for rebuilding an array when a drive fails.

RAID 0 Configurations

A drive failure in a RAID 0 configuration causes data loss across the entire array. To recover from a drive failure, the array must be rebuilt from scratch. To rebuild the array:

1. Determine the failed drive by viewing the information provided at POST and in the Integrated ATA RAID Configuration Utility by pressing the **F8** key.
2. Power down the server, and then replace the required drive.
3. Reboot the server and configure the array using the menu options in the Integrated ATA RAID Configuration Utility by pressing the **F8** key.

Refer to "Integrated ATA RAID Configuration Utility" later in this chapter for information on the utility menu options.

RAID 1 Configurations

NOTE: This configuration is the only one where a spare pool configuration will have any value. A spare will provide a means by which a failed drive in a RAID 1 configuration may be rebuilt online.

In a RAID I configuration, there are two possible scenarios if a hard drive fails:

If there is an online spare configured:

1. The auto-rebuild process occurs without user intervention, removing the failed drive from the array and adding the spare to the array.
2. To reconfigure the online spare:
   a. Power down the server, and then replace the failed drive.
   b. Run the Integrated ATA RAID Configuration Utility by pressing the **F8** key, and then configure the drive as a spare.

Refer to "Integrated ATA RAID Configuration Utility" later in this chapter for information on the utility menu options.

If there is not an online spare configured:

1. Power down the server, and then replace the failed drive.
2. Reboot the server.
3. Reconfigure the array, choosing one of the following options:
   c. Run the rebuild in the Integrated ATA RAID Configuration Utility (F8).
   d. Let the auto-rebuild take place when the operating system is up and running

RAID 0+1 Configurations

In a RAID 0+1 situation, multiple drive failures can be handled as long as both elements of a mirror have not failed.

To rebuild the array:

1. Power down the server, and then replace the failed drive.
2. Reboot the server.
3. Reconfigure the array, choosing one of the following options:
   a. Run the rebuild in the Integrated ATA RAID Configuration Utility by pressing the **F8** key.
   b. Let the auto-rebuild take place when the operating system is up and running

Refer to "Integrated ATA RAID Configuration Utility" later in this chapter for information on the utility menu options.

Integrated ATA RAID Configuration Utility

The setup screen of the Integrated ATA RAID Configuration Utility has three menu windows:

- **Array Information**
- **Physical Drive Information**
- **Help Information**

Array Information

IMPORTANT: You cannot add drives or remove drives from an array that has been already configured.

The **Array Information** window of the setup screen displays all the drive arrays configured. Use this section to create, delete, or edit the existing configurations. The drive arrays are displayed as a node in a tree, like Microsoft Windows Explorer. When opened, each node displays the properties of the array. Press the up arrow and down arrow keys to navigate the properties, and then press the **Enter** key to edit your selection.

Physical Drive Information

The **Physical Drive Information** window displays all the physical drives connected to the ATA channels and their properties. Press the up arrow and down arrow keys to navigate this section. This window is not editable.

Help

The **Help** window displays hints on available options and provides a list of keys that you can use to perform tasks, such as:

- Switch Windows (the TAB key)—switches the control back and forth between the Array Information and the Physical Drive Information windows.
- Auto Configure RAID 0 (the F1 key)—automatically creates and configures a striped array based on the available physical drives installed.
- Auto Configure RAID 1 (the F2 key)—automatically creates and configures a mirrored array based on the available physical drives installed. You must have a minimum of two free hard drives in the array.
- Auto Configure RAID 0+1 (the F3 key)—automatically creates and configures a RAID 0+1 array based on the available physical drives installed. You must have a minimum of four hard drives in the array.

IMPORTANT: All previous settings are lost when the **Auto Configure** option is run for striped, mirrored, and RAID 0+1 arrays.

- **Create Array (the F4 key)**—creates a drive array. When this option is selected, a default array template is created. You must edit the array properties to complete the array creation. Use the arrow keys to highlight a property field, and then press the **Enter** key to edit that property. The array properties are as follows:
  - **Array Type**—selects the intended RAID mode including RAID 0, RAID 1, RAID 0+1, and Spare. The default for the Array Type option is RAID 0.
  - **Drive(s)**—selects the drives for the array. This term refers to the drive number listed in the Physical Drives Information box, not the number of drives attached. Use the arrow keys, and then press the spacebar to select or deselect the drive or drives. Press the **Enter** key when done. There is no default for this setting.
  - **Stripe Size**—changes the stripe size. This field applies only to RAID 0 arrays. The default stripe size is 64 KB.

IMPORTANT: RAID configurations do not support a stripe size less than 32 KB.

IMPORTANT: You cannot change the stripe size of an array that has been already configured.

  - — **Drive Size**—displays the size of the array and cannot be edited. If the array type is stripe, then the drive size is the total of all the drives selected. When mirrored, the drive size is shown by an individual drive.
  - — **Build Array**—used to rebuild the array using a spare drive. When Build Array starts, it prompts the user to select the target drive, and then the rebuild starts. This option applies only to RAID 1 and RAID 0+1 arrays.

- **Delete Array (the F5 key)**—allows you to delete a currently configured array.
- **Restore Old Configuration (the F6 key)**—restores the configuration that was there before you entered the utility.
- **Edit Options (the F7 key)**—edits the physical drive option status boxes located in the top right corner of the **Physical Drive Information** window. The options are as follows:
  - — **WC-OFF**—enables or disables write cache

CAUTION: Enabling write cache may cause data loss or corruption during an unexpected loss of power.

  - — **DMA-ON**—enables or disables DMA transfers

Pressing the **F7** key will allow you to enable or disable these options. Press the **F7** key, move the cursor to the desired box, and then press the spacebar to select the option. When enabled, the option status boxes will change from red to green.

- **Save and Exit (the F10 key)**—saves the configuration and exits the utility.

If you do not want to save the configuration or any changes that you have made, press the **Esc** key. Respond appropriately to the subsequent message boxes requiring confirmation.

Power Switch and LED

IMPORTANT: To completely remove all power from the system, you must disconnect the power cord from the server.

To remove the power switch:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Disconnect the power switch cable from the system board.

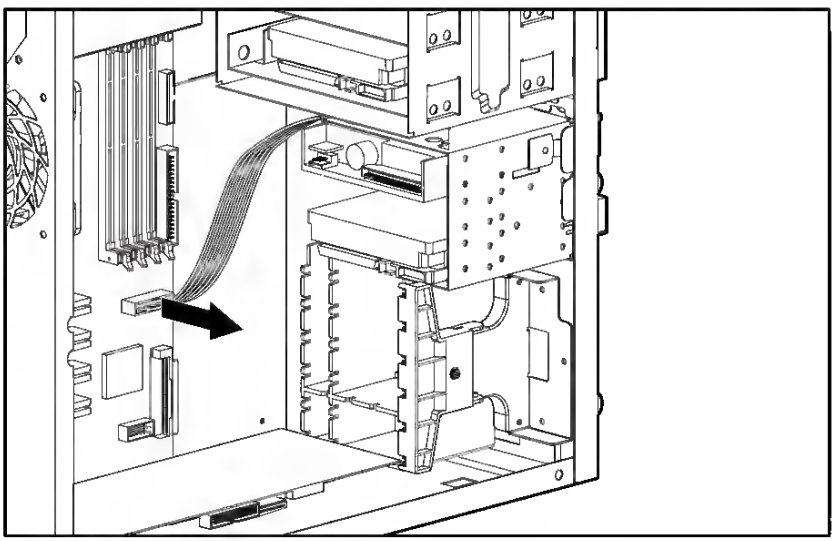

Figure 2-16: Disconnecting the power switch cable from the system board

5. From the front of the chassis, squeeze the sides of the power switch to disengage the two retainer clips from the chassis (1), and then gently remove the power switch from the chassis (2).
6. Also, from the front of the chassis, squeeze the side of the LED to disengage the two retainer clips from the chassis (3), and then gently remove the LED from the chassis (4).

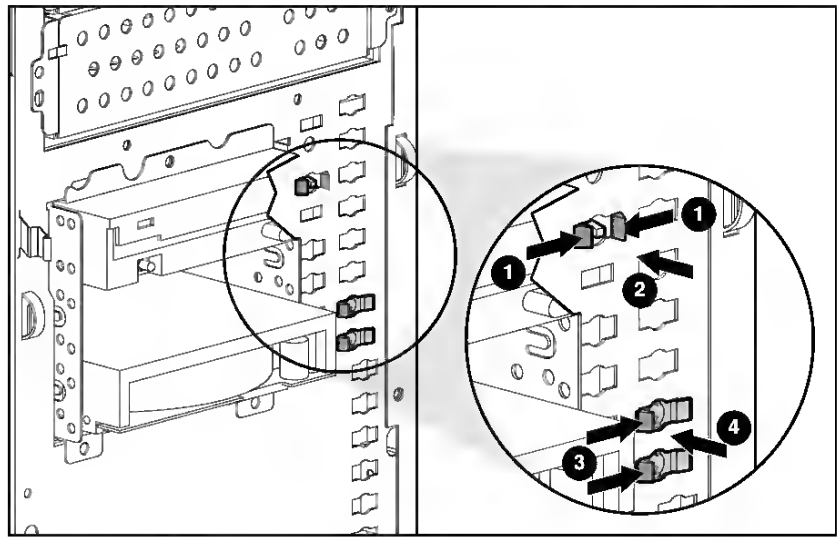

Figure 2-17: Removing the power switch and LED

To replace the power switch and LED, reverse steps 2 through 6.

Removing a Device from a Removable Media Bay

IMPORTANT: The cabling instructions in the following section apply only to the SCSI model of the server or models with a SCSI option card installed.

To remove a device from a removable media bay:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
3. Disconnect the power and data cables from the back of the device.
4. Remove the screws from the front of the removable tray (1).
5. Remove the removable media tray from the chassis (2).

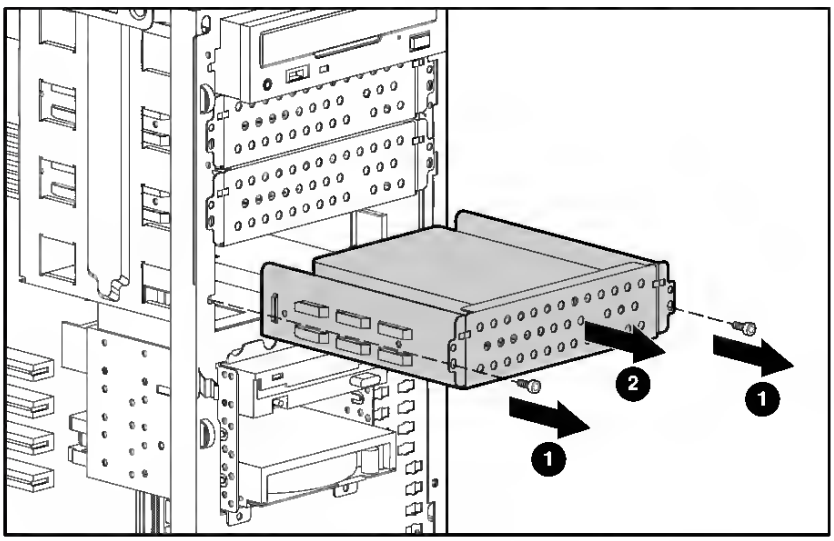

Figure 2-18: Removing the removable media tray from the chassis

6. Remove the screws on each side of the device (1).
7. Gently slide the device out from the front of the chassis (2).

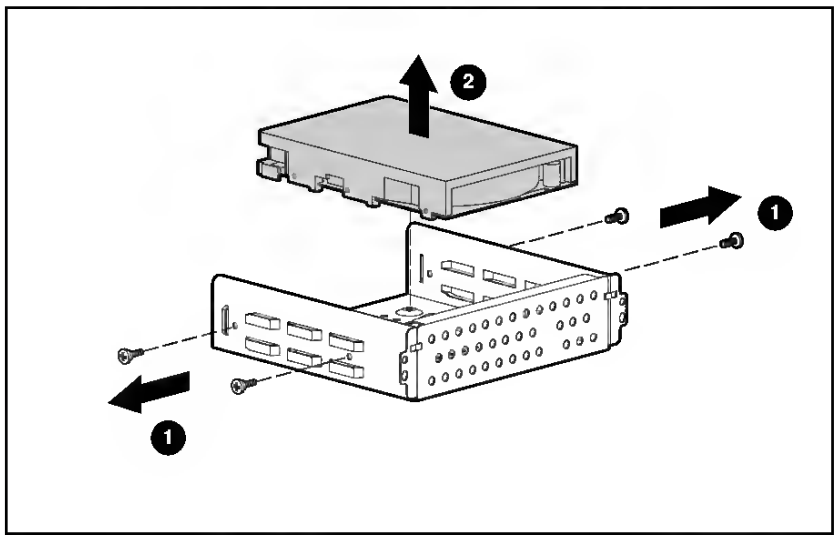

Figure 2-19: Removing a device from the removable media bay

To replace a removable media bay device, reverse steps 2 through 7.

Expansion Slots

The following illustration and table show the expansion slot locations.

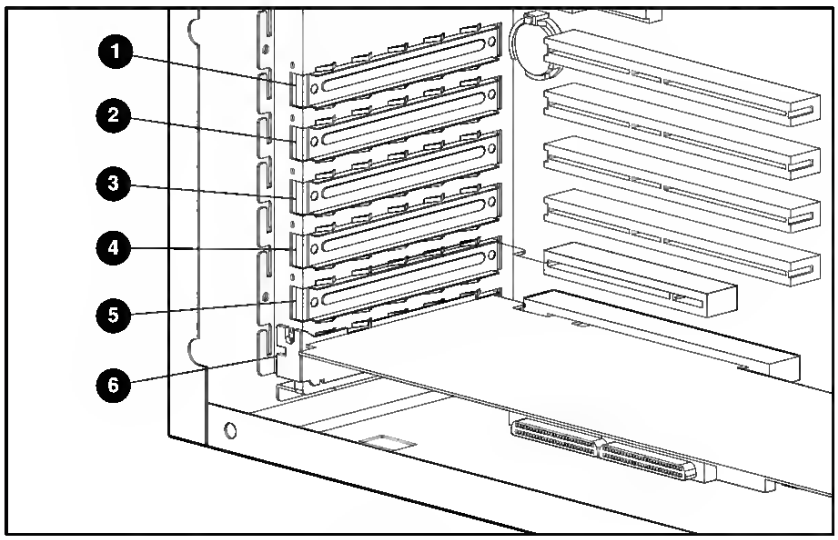

Figure 2-20: Expansion slot locations

Table 2-4: Expansion Slots

Item	Description	Slot Number
1	64-bit PCI slot (for half-length boards)	1
2	64-bit PCI slot	2
3	64-bit PCI slot	3
4	64-bit PCI slot	4
5	32-bit PCI slot	5
6	Server Feature Board slot	6

Expansion Board Guide

To remove the expansion board guide:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Remove all expansion boards supported by the board guide.
5. Push in the four locking tabs (1), and then pull the guide back and away from chassis (2).

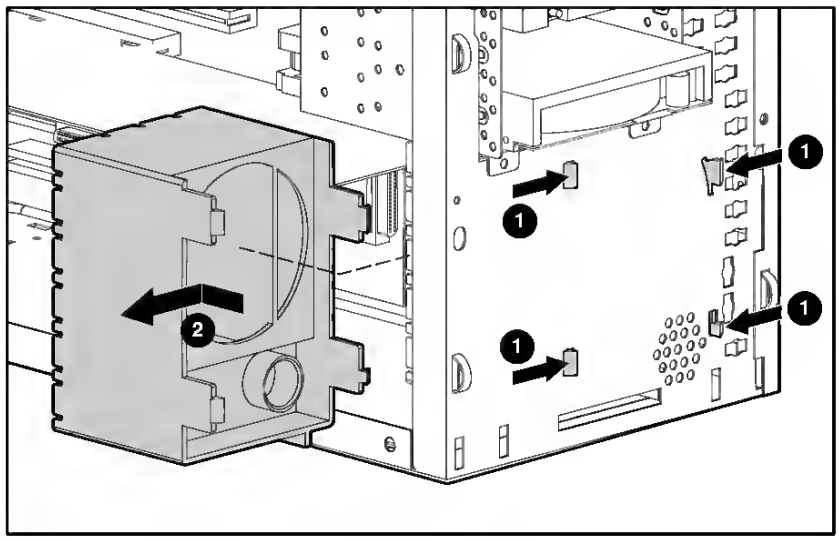

Figure 2-21: Removing the expansion board guide

To replace the expansion board guide, reverse steps 2 through 5.

Removing an Expansion Slot Retainer

To remove an expansion slot retainer:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
3. Release the expansion board retainer by loosening the screw (1) and pivoting the retainer back towards the front of the chassis (2).

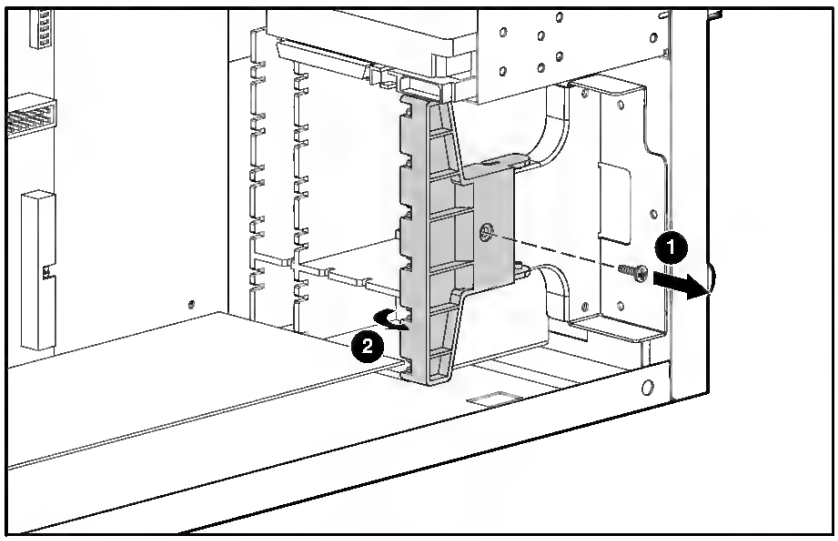

Figure 2-22: Removing an expansion board retainer

To replace an expansion board retainer, reverse steps 2 and 3.

Memory Modules

The server supports PC133-MHz ECC Registered SDRAM DIMMs. Additional DIMMs are available to upgrade the memory. The server has four DIMM sockets located on the system board.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. Refer to "Electrostatic Discharge Information" earlier in this chapter for more information.

CAUTION: When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

The following guidelines must be followed when installing or replacing memory:

- Use only PC133-MHz Registered ECC SDRAM DIMMs.
- Memory modules must be industry-standard, 168-pin, PC 133-MHz Registered SDRAM DIMMs. The SDRAM DIMMs must support CAS Latency 3 (CL=3).
- Do not mix ECC and non-ECC SDRAM DIMMs. If different types of memory modules are mixed, the system does not properly function.

NOTE: Memory modules do not need to be installed in pairs and can be installed in any sequence.

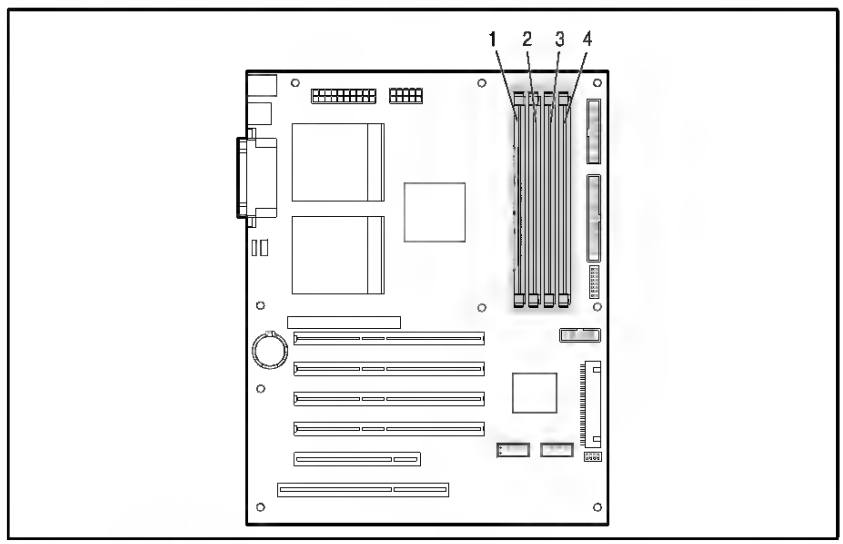

Figure 2-23: Memory module socket locations

Removing a Memory Module

To remove a memory module:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Press outward on both latches of the memory module socket at the same time (1). This step releases the DIMM and pushes it partially out of the socket.
5. Lift the memory module from the socket (2).

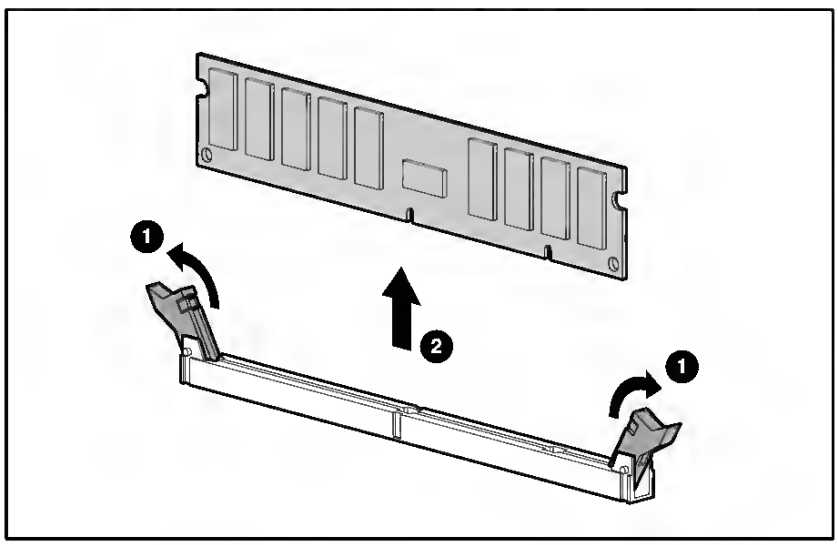

Figure 2-24: Removing a memory module

To replace a memory module, reverse steps 2 through 5.

Processor Sockets and Processor Power Module Slots

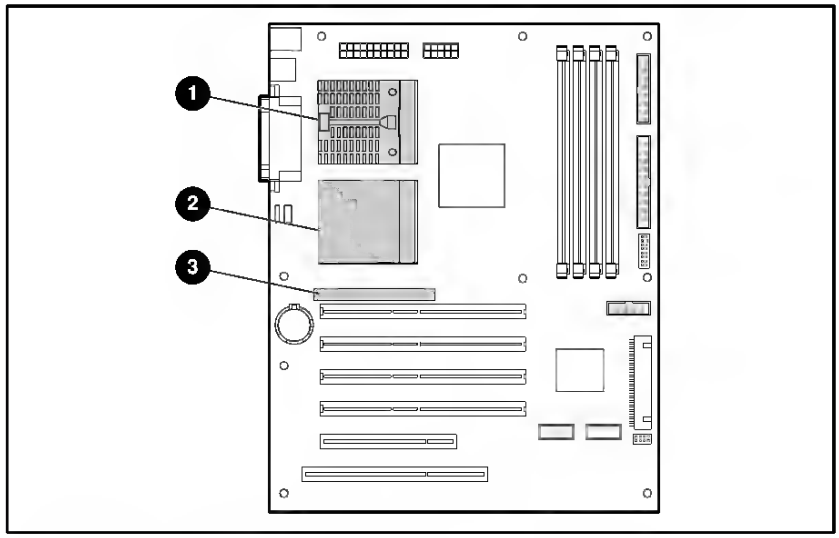

Figure 2-25: Locating the processor sockets and the Processor Power Module (PPM) slots

Table 2-5: Processor Sockets and PPM Slots

Item	Description
1	Processor socket 1 (populated)
2	Processor socket 2
3	PPM 2 slot

Note: The PPM for Processor 1 is integrated into the system board.

Processor with Heatsink

To remove a processor with heatsink:

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. Refer to "Electrostatic Discharge Information" earlier in this chapter for more information.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

NOTE: The heatsink of the 1-GHz processor is black. All other processor heatsinks are silver.

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Remove the internal fan baffle. Refer to "Internal Fan Baffle" earlier in this chapter.
5. Push up on the assembly clip lever to disengage the processor from the socket (1), and then unhook each side of the processor from the socket.
6. Lift up the lever on the processor socket until it releases (2).

IMPORTANT: The lever must be perpendicular to the system board to unlock the processor unit.

7. Remove the processor from the processor socket (3).

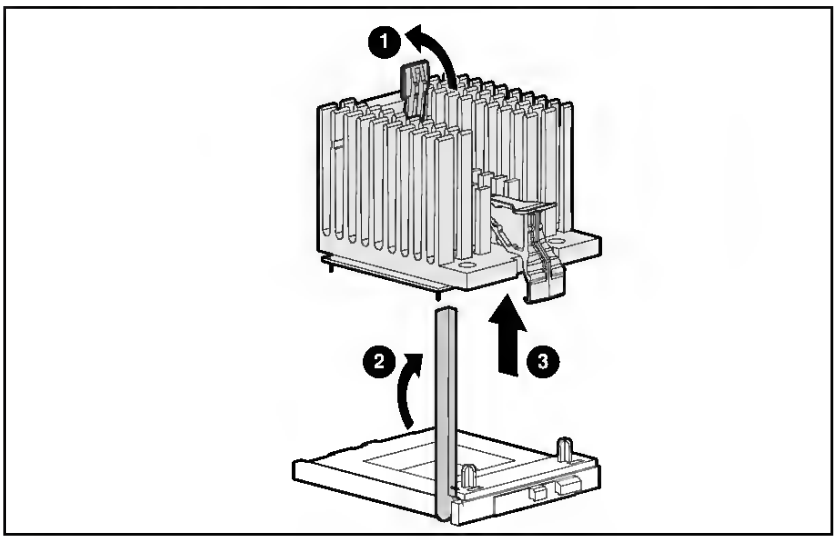

Figure 2-26: Removing the processor with heatsink

To replace the processor with heatsink, reverse steps 2 through 7.

Processor Power Module

To remove a Processor Power Module, open the latches of the Processor Power Module (PPM) (1), and then remove the PPM (2) from the slot.

NOTE: The PPM for Processor 1 is integrated on the system board and cannot be removed.

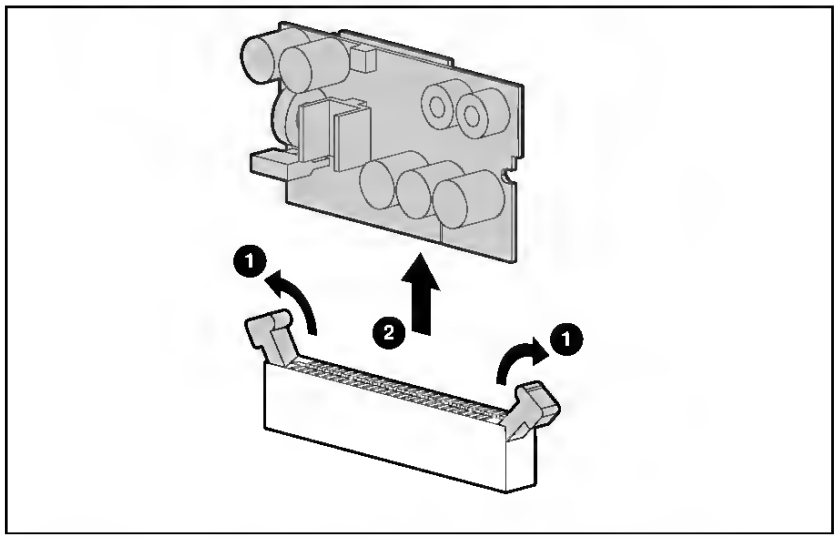

Figure 2-27: Removing the PPM (Processor Power Module) for processor 2

To replace the PPM, reverse the previous step.

Server Feature Board

To remove a Server Feature Board:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Disconnect any cables connected to the Server Feature Board.
5. Remove the expansion slot retainer. Refer to "Removing an Expansion Slot Retainer" earlier in this chapter.
6. Remove the screw securing the Server Feature Board to the chassis (1), and then pull the Server Feature Board out of the server (2).

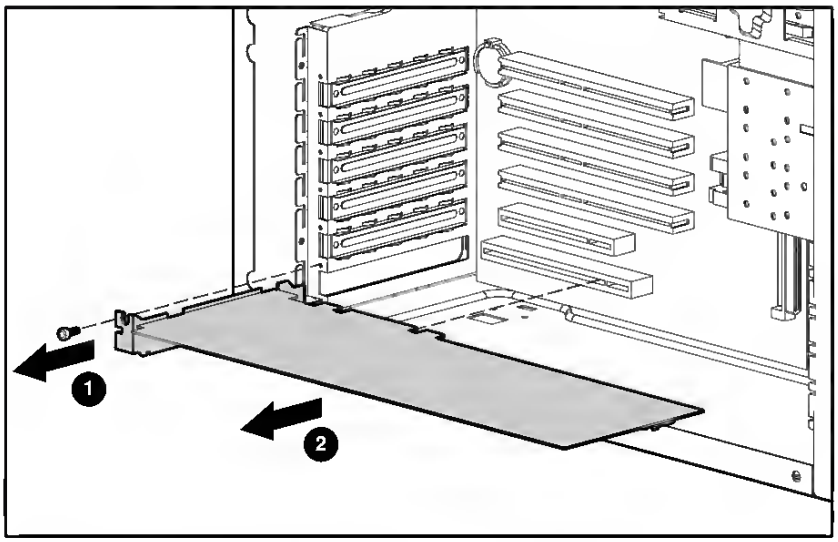

Figure 2-28: Removing the Server Feature Board

NOTE: The Server Feature Board is located only in slot 6.

To replace the Server Feature Board, reverse steps 2 through 6.

System Board

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. Refer to "Electrostatic Discharge Information" earlier in this chapter for more information.

To remove the system board:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Remove all expansion boards seated on the system board.
5. Disconnect all cables from the system board.
6. Remove the ten screws securing the system board to the chassis (1).
7. Pull the system board out of the chassis (2).

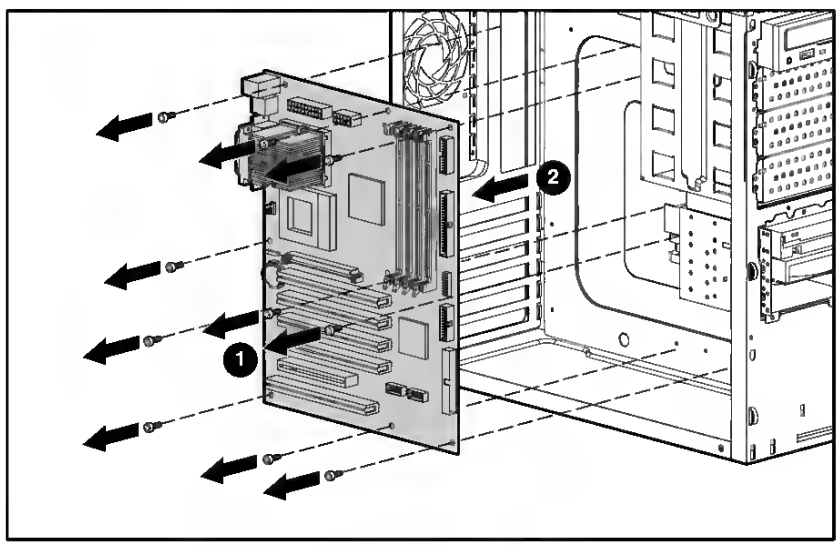

Figure 2-29: Removing the system board

To replace the system board, reverse steps 2 through 7.

Power Supply

To remove the power supply:

WARNING: To reduce the risk of electric shock or damage to the equipment:

- **Unplug the power cord before removing the power supply from the server.**
- **Install the power supply before connecting the power cord to the power supply.**

CAUTION: To avoid dropping the power supply, pull out and hold the power supply with a firm grip.

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Disconnect all power cables from the devices and system board.
5. Remove the four screws securing the power supply to the rear of the chassis (1).
6. Slide the power supply forward, and then lift the power supply from the chassis (2).

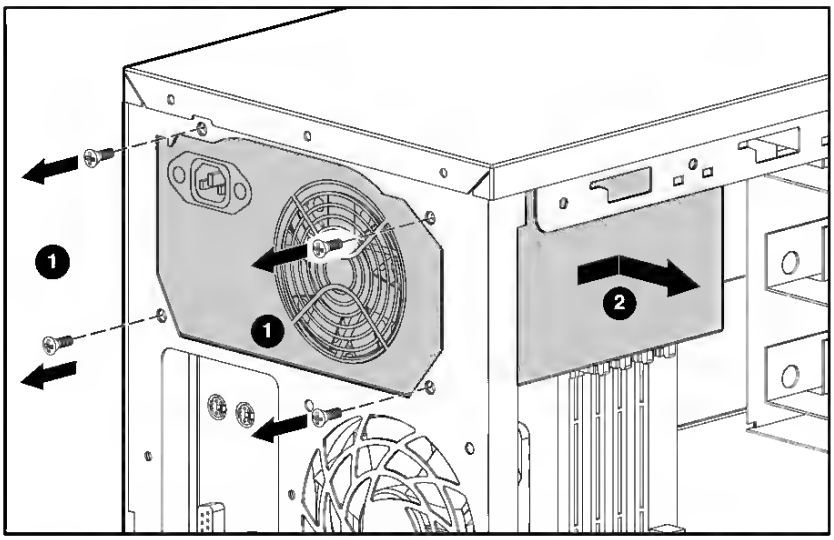

Figure 2-30: Removing the power supply

To replace the power supply, reverse steps 2 through 6.

Replacing a Battery

The server has nonvolatile memory, which requires two batteries to retain system information. There is a battery on the system board and a battery on the Server Feature Board.

Replacing the System Board Battery

If your server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. When replacing a battery, use a 3-volt CR2032 lithium battery.

After you have completed the battery installation, run the ROM Based Setup Utility (RBSU) by pressing the **F9** key to reconfigure your system. Refer to the *Compaq ROM Based Setup Utility User Guide*.

WARNING: The system board contains a lithium battery. There is a risk of fire and chemical burn if the battery is improperly handled. Do not disassemble, crush, puncture, or short external contacts, dispose of in water or fire, or expose the battery to temperatures higher than 60°C (140°F).

CAUTION: To prevent damage to the equipment or loss of information, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet before removing the access panel.

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. Refer to "Electrostatic Discharge Information" earlier in this chapter for more information.

To replace the lithium battery from the system board:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Locate the battery on the system board.

NOTE: If you have expansion boards installed, it may be necessary to remove them to gain access to the battery.

5. Press the latch at the top of the battery holder to release the battery (1), and then lift the battery away from the holder (2).

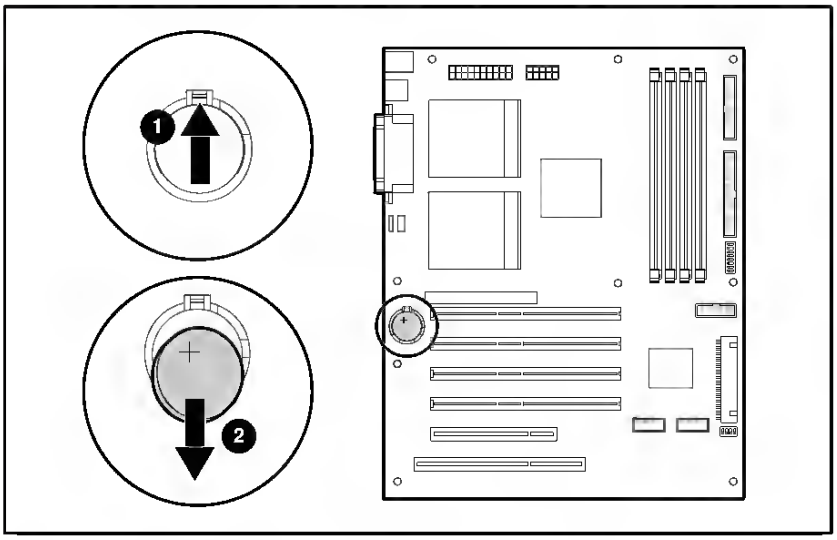

Figure 2-31: Locating and removing the battery from the system board

IMPORTANT: Positive (+) polarity must be positioned up.

6. Side the replacement battery into the proper position with the positive (+) side up.
7. Replace the server access panel and connect cables to the server.
8. Run RBSU to reconfigure your system by pressing the **F9** key when prompted during server startup. Refer to the *Compaq ROM Based Setup Utility User Guide* for more information on RBSU.

Replacing the Server Feature Board Battery

WARNING: The Server Feature Board contains a lithium battery. There is a risk of fire and chemical burn if the battery is improperly handled. Do not disassemble, crush, puncture, or short external contacts, dispose of in water or fire, or expose the battery to temperatures higher than 60°C (140°F).

CAUTION: Electrostatic discharge (ESD) can damage electronic components. Be sure that you are properly grounded (earthed) before beginning any installation procedure. Refer to "Electrostatic Discharge Information" earlier in this chapter for more information.

When replacing the battery on the Server Feature Board, use a CR2032 3-volt lithium battery. To replace the battery from the Server Feature Board:

1. Complete the preparation procedures. Refer to "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel. Refer to "Front Bezel" earlier in this chapter.
3. Remove the access panel. Refer to "Access Panel" earlier in this chapter.
4. Remove the Server Feature Board. Refer to "Server Feature Board" earlier in this chapter.
5. Locate the battery on the Server Feature Board. Release the battery by pressing on the battery holder latch (1), and then lift the battery away from the holder (2).
6. Install the replacement battery into the proper position with the positive (+) side up.

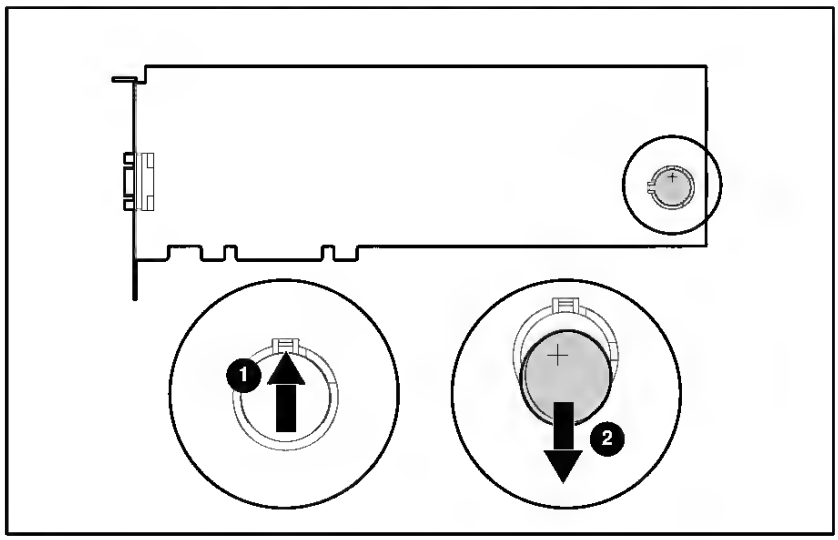

Figure 2-32: Locating and removing the battery from the Server Feature Board

IMPORTANT: Positive (+) polarity must be positioned up.

7. Replace the Server Feature Board in expansion slot 6.
8. Replace the access panel, and then connect cables to the server.
9. Run RBSU to reconfigure your system by pressing the **F9** key when prompted during server startup. Refer to the *Compaq ROM Based Setup Utility User Guide* for more information on RBSU.

3

Diagnostic Tools

This chapter provides an overview of the software and firmware diagnostic tools available for the Compaq ProLiant ML330 Generation 2 server.

Diagnostic Tools Utility Overview

The following utilities were developed to assist in diagnosing problems, testing the hardware, and monitoring and managing the server hardware.

Table 3-1: Diagnostic Tools

Tool	What it is	How to run it
Compaq Diagnostics Utility	Utility to assist testing and/or verifying operation of Compaq hardware. If problems are found, Compaq Diagnostics isolates failures down to the replaceable part whenever possible.	Diagnostics and utilities must be accessed when a system configuration error is detected during Power-On Self-Test (POST). For a complete list of POST error messages, see the *Compaq Servers Troubleshooting Guide.* Compaq Diagnostics software is also available on the Compaq SmartStart for Servers CD. A Diagnostics diskette can be created from the SmartStart for Servers CD, and Diagnostics can then be run from the diskette.
Compaq Insight Manager application	A client/server application used to remotely manage Compaq systems in a network environment. Reports hardware fault conditions (both failure and prefailure) and collects data for reporting and graphing.	For more information, refer to the Compaq Management CD and the *Compaq Insight Manager User Guide.*
Compaq Survey Utility	An online information-gathering program that runs on servers, gathering critical hardware and software information from various sources. A utility for servers running Microsoft Windows NT, Linux, or Novell NetWare. If a significant change occurs between data-gathering intervals, previous information is marked, and the survey text file is overwritten to reflect the latest configuration and changes since the last configuration. This utility provides a historical record of change events for server hardware and software.	Compaq Survey Utility automatically runs at startup and on specified time intervals. You can modify the data-gathering interval by modifying the command-line parameters. For more information on Compaq Survey Utility, including installation and application procedures, refer to the *Compaq Survey Utility Online Help User Guide* accessed through the Compaq website: www.compaq.com/support/files/server/us/

continued

Table 3-1: Diagnostic Tools *continued*

Tool	What it is	How to run it
Compaq SmartStart for Servers software	Located on the SmartStart for Servers CD, SmartStart is the intelligent way to set up your Compaq server. The SmartStart for Servers CD is used to load the system software, thereby achieving a well-integrated server and ensuring maximum dependability and supportability. The SmartStart CD contains diagnostic utilities and ROMPaq tools.	Power up from the SmartStart for Servers CD.
SmartStart Diskette Builder	Creates a diskette version of the utility from the SmartStart for Servers CD.	Use a workstation running Microsoft Windows 95, Windows 98, Windows NT, or Windows 2000. You also need several 1.44-MB diskettes. Insert the SmartStart CD into the workstation drive. The CD automatically runs the Diskette Builder Utility; however, if the system does not support the "auto-run" feature, use Windows Explorer to run *CD-ROM DRIVE:*\DSKBLDR\DSKBLDR.EXE.
ROMPaq Utility	A utility that upgrades the current system ROM.	Insert a ROMPaq diskette into the diskette drive, remove power from the system, and then power up the system again.

continued

Table 3-1: Diagnostic Tools *continued*

Tool	What it is	How to run it
ROM Based Setup Utility (RBSU)	Utility used to configure some hardware installed in or connected to the server. Specifically, it can: • Resolve resource conflicts in areas such as memory, port addresses, and interrupts (IRQs) • Configure PCI boards automatically • Provide switch and jumper settings • Manage installation of memory, processor upgrades, and mass storage devices such as hard drives, tape drives, and diskette drives • Store configuration information in nonvolatile memory • Configure the platform for an operating system	Run RBSU directly from the system ROM by pressing the **F9** key when prompted during POST to enter the utility.
Automatic Server Recovery-2 (ASR-2)	A tool that lets the server restart automatically after a catastrophic operating system failure, including software errors, OS lockups, environmental abnormalities, and some hardware errors. A system failsafe timer, the ASR-2 timer, is started when the Compaq System Management driver, also known as the health driver, is loaded. The Compaq Insight Manager console notifies you in the event of an ASR-2 restart. You can disable ASR-2 from the Compaq Insight Manager console.	This tool is a function of the hardware/software system through RBSU. Be sure that this tool is enabled through RBSU. The systems management drive must be loaded to activate ASR-2.

continued

Table 3-1: Diagnostic Tools *continued*

Tool	What it is	How to run it
Integrated ATA RAID Configuration Utility (ATA models only)	Supports and configures RAID arrays. The features include: • Optimized drive access • RAID support before operating system loads • Automatic detection and configuration • Ability to handle configuration changes • Support for PIO modes 0-4, MDMA modes 0-2, and Ultra DMA modes 0-5 (0-5 for ATA/100) • Support for RAID levels 0, 1, and 0+1 • Multiple drive rebuilding • Special handling of error log, spare drive, and rebuilding	After all hard drives have been installed and connected, press the **F8** key during startup to run the Integrated ATA RAID Configuration Utility and view the setup screen. ROM will automatically configure drives to RAID 0 if the user does not run the F8 utility. If the user needs to turn off the Integrated ATA RAID Configuration Utility, they can do so by right-clicking on the tray icon and selecting **Quit Spy.** Turning off this utility will turn off the ability for on-line spares to be rebuilt in the event there is a drive failure. The user will need to power up the server and rebuilt in the RAID Configuration Utility by pressing the **F8** key. To turn on the Integrated ATA RAID Configuration Utility, power up the system or log off the server and then log back on.
Power-On Self-Test (POST)	The POST is a series of diagnostic tests that checks firmware and assemblies to ensure that the system is properly functioning.	POST runs automatically on Compaq servers when the system is powered up.

For More Information

For detailed information about each of these diagnostic tools, see the *Compaq Servers Troubleshooting Guide* on the documentation CD. For the most recent version of this guide, go to the Compaq website:

www.compaq.com

4

Connectors, Switches, and LED Indicators

This chapter contains illustrations and tables identifying connectors, switches, and LED locations on the system board, rear panel, and Server Feature Board for the Compaq ProLiant ML330 Generation 2 server.

Connectors

This section contains graphics and tables identifying connector and component locations on the system board, rear panel, and Server Feature Board for the server.

System Board Components

The following illustration and table show the system board components for the server.

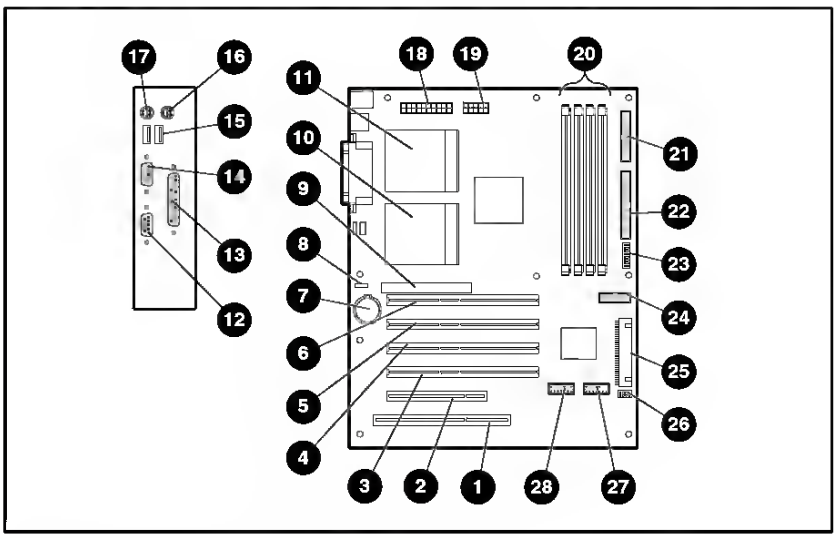

Figure 4-1: System board components

Table 4-1: System Board Components

Item	Description	Item	Description
1	Server Feature Board slot 6	15	USB port connectors
2	PCI slot 5 (32-bit)	16	Mouse connector
3	PCI slot 4 (64-bit)	17	Keyboard connector
4	PCI slot 3 (64-bit)	18	Power supply connector (20-pin)
5	PCI slot 2 (64-bit)	19	Power supply connector (10-pin)
6	PCI slot 1 (64-bit) (for half-length boards)	20	DIMM sockets (four)
7	Battery	21	Diskette drive connector
8	System fan connector	22	Primary IDE channel
9	Processor Power Module (PPM) slot 2	23	System configuration switch
10	Processor socket 2	24	Power button connector
11	Processor socket 1 (populated)	25	Secondary IDE channel
12	Serial port connector B	28	System ID switch
13	Parallel port connector	27	Compaq Remote Insight Management connector (16-pin)
14	Serial port connector A	28	Compaq Remote Insight Management connector (30-pin)

Rear Panel Connectors

The following illustration and table show the rear panel connectors for the server.

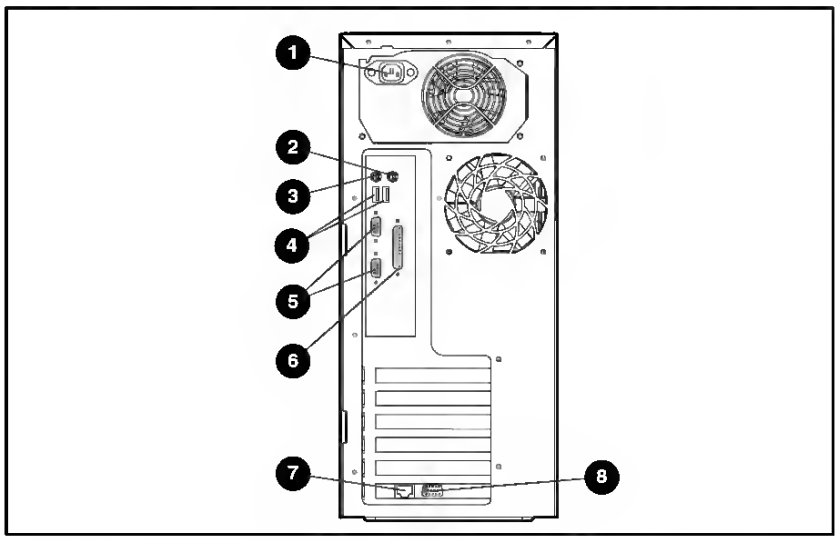

Figure 4-2: Rear panel connectors

Table 4-2: Rear Panel Connectors

Item	Description	Item	Description
1	Power cord connector	5	Serial port connectors
2	Mouse connector	6	Parallel port connector
3	Keyboard connector	7	RJ-45 Ethernet for NIC connector
4	USB port connectors	8	Video connector

Server Feature Board Components (SCSI Model)

The following illustration and table show the Server Feature Board components for the server (SCSI model).

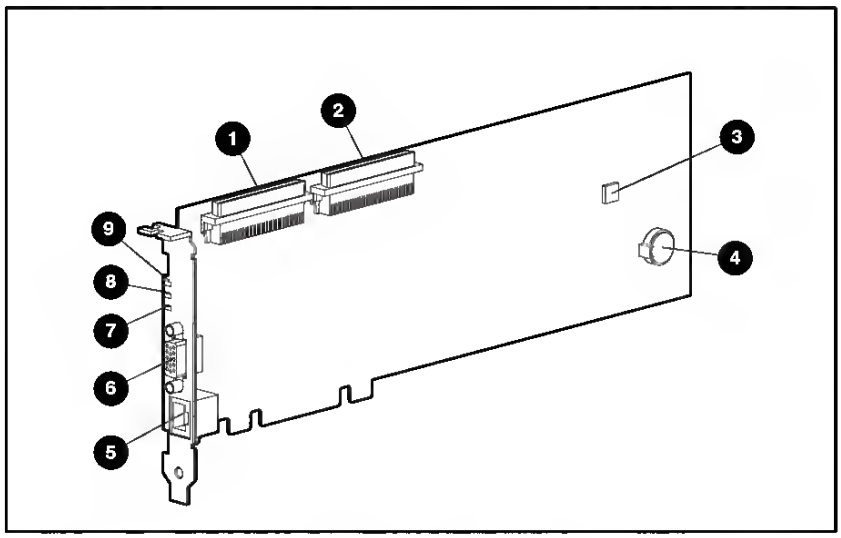

Figure 4-3: Server Feature Board components (SCSI model)

Table 4-3: Server Feature Board Components (SCSI Model)

Item	Description	Item	Description
1	SCSI controller channel B	6	Video connector
2	SCSI controller channel A	7	Network speed LED
3	NMI debug button	8	Network link LED
4	Replaceable lithium CR2032 battery	9	Network activity LED
5	RJ-45 Ethernet connector for NIC		

Server Feature Board Components (ATA Model)

The following illustration and table show the Server Feature Board components for the server (ATA model).

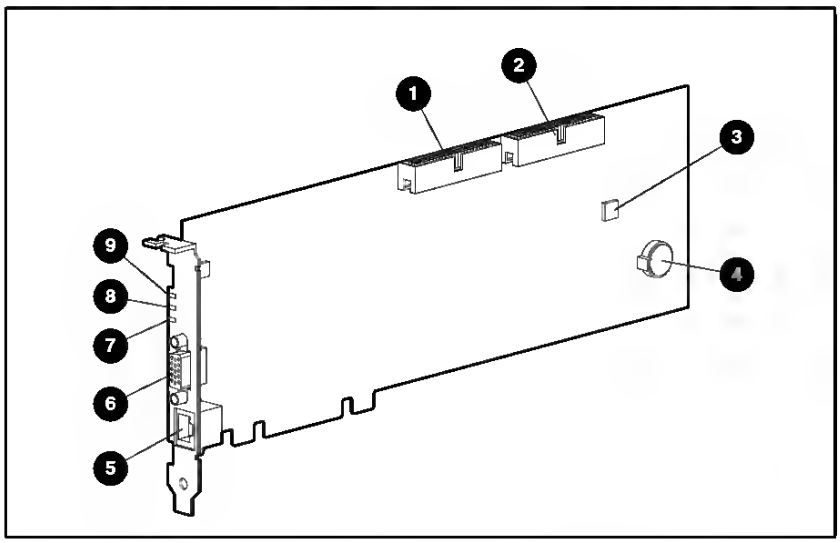

Figure 4-4: Server Feature Board components (ATA model)

Table 4-4: Server Board Components (ATA Model)

Item	Description	Item	Description
1	ATA controller channel A (primary)	6	Video connector
2	ATA controller channel B (secondary)	7	Network speed LED
3	NMI debug button	8	Network link LED
4	Replaceable CR2032 lithium battery	9	Network activity LED
5	RJ-45 Ethernet connector for NIC		

Internal SCSI Components

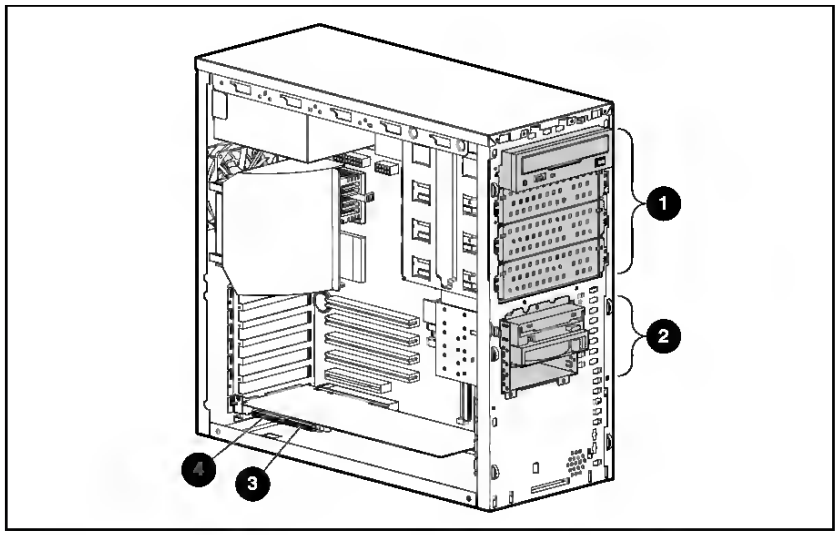

Figure 4-5: Internal SCSI components

Table 4-5: Internal SCSI Components

Item	Description
1	Removable media bay area
2	Hard drive bay area
3	SCSI controller channel A (primary)
4	SCSI controller channel B (secondary)

Internal ATA Components

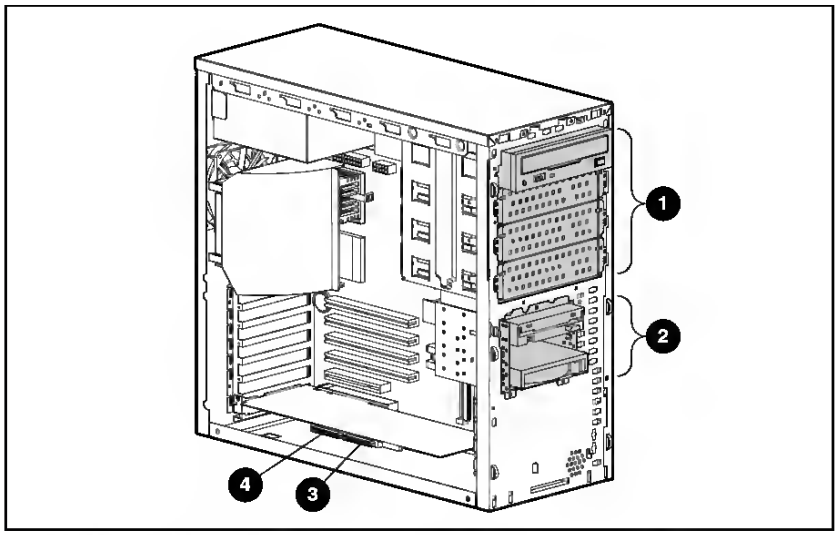

Figure 4-6: Internal ATA components

Table 4-6: Internal ATA Components

Item	Description
1	Removable media bay area
2	Hard drive bay area
3	ATA controller channel B (secondary)
4	ATA controller channel A (primary)

Switches

The server contains two switchbanks. This section explains the use of each reserved and nonreserved switch.

System Configuration Switch

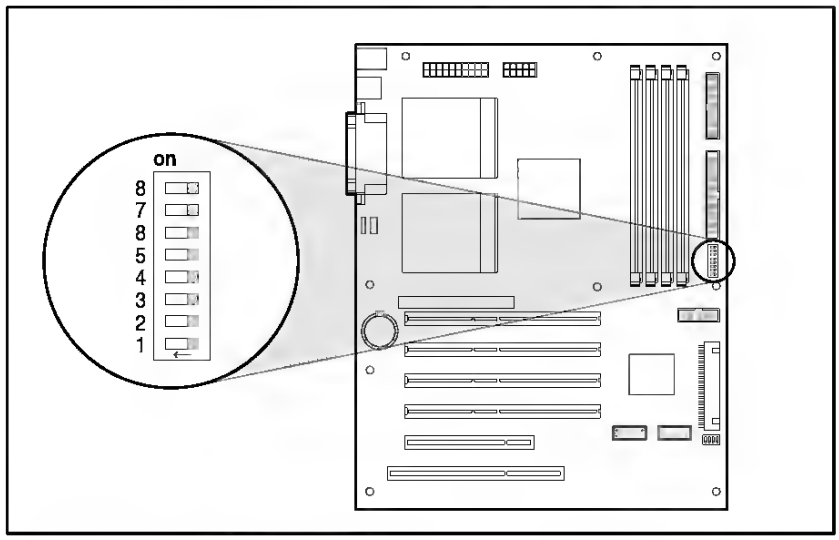

Figure 4-7: System configuration switch default settings

Table 4-7: System Configuration Switch Default Settings

Position	Default	Description	Settings
1	Off	Video	Off = Video enabled On = Video disabled
2	Off	Lock configuration	Off = Normal operation On = Configuration changes cannot be made
3	Off	Tower/rack configuration	Off = Tower configuration On = Rack configuration
4	Off	Enable diskette boot	Off = Normal operation On = Enable diskette boot
5	Off	Password disable	Off = Disable On = Disable password prompts
6	Off	Clear CMOS and NVRAM	Off = Normal On = When the server is powered up, all system configuration information is erased
7	Off	Reserved	N/A
8	Off	Reserved	N/A

NOTE: Switch positions 7 and 8 are reserved for Compaq authorized service providers only. Do not change the specified default setting for these positions, unless instructed otherwise.

System ID Switch Settings

The following illustration and table show the system ID switch settings for the server.

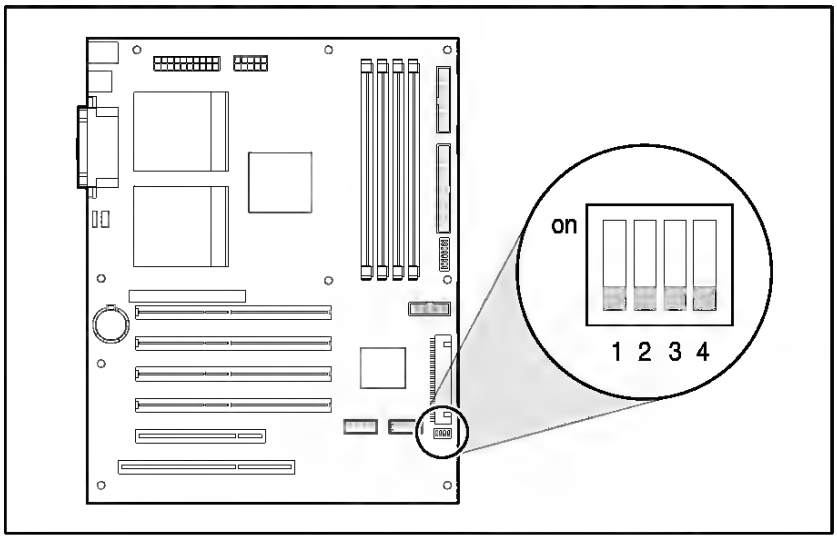

Figure 4-8: System ID switch default settings

Table 4-8: System ID Switch Settings

Item	Default	Function
1	Off	Reserved
2	Off	Reserved
3	Off	Reserved
4	Off	Reserved

LEDs

This section contains graphics information on the following LEDs:

- System LEDs
- System board LEDs
- Network controller LEDs

System LEDs

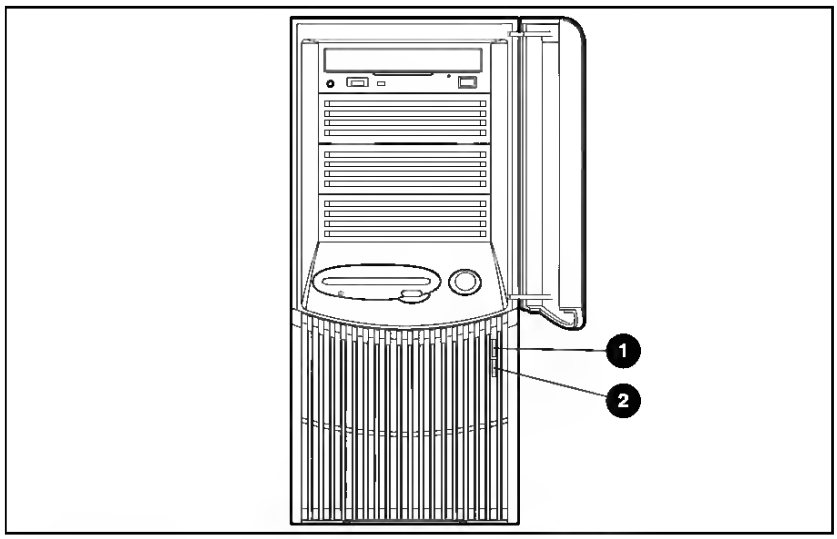

Figure 4-9: System LEDs

Table 4-9: System LEDs

Item	Description	Status	Means
1	Power On/Standby LED	Green	System on, AC power OK. Do not remove power from system.
		Amber	System off, AC power OK.
		Flashing	System in standby mode. AC power OK. Do not remove power from system.
		Off	System off, no AC power.
2	Hard drive LED	On or flashing	A hard drive is being accessed.
		Off	No hard drive is currently being accessed.

System Board LEDs

The following illustration and table show the system board LEDs for the server.

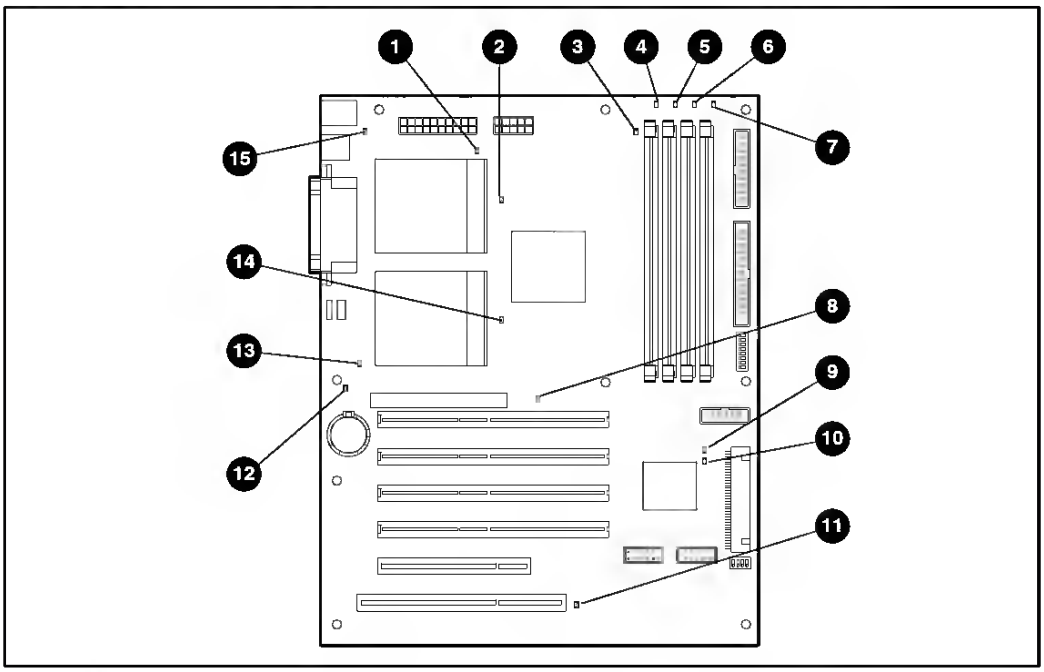

Figure 4-10: System board LEDs

Table 4-10: System Board LEDs

Item	Description	Status
1	AC power	Off = The AC power cord is not plugged into the power supply or the power supply failed. Green = Power supply is on and functioning.
2	Processor 1 thermal	Off = Processor 1 temperature normal. Amber = Thermal trip for processor 1 detected. See POST error messages for appropriate instructions.
3	PPM 1 (integrated) failure	Off = PPM 1 functioning. Amber = PPM 1 failed.

continued

Table 4-10: System Board LEDs *continued*

Item	Description	Status
4	DIMM 1 failure	Off = DIMM 1 functioning Amber = DIMM 1 failed
5	DIMM 2 failure	Off = DIMM 2 functioning Amber = DIMM 2 failed
6	DIMM 3 failure	Off = DIMM 3 functioning Amber = DIMM 3 failed
7	DIMM 4 failure	Off = DIMM 4 functioning Amber = DIMM 4 failed
8	PPM 2 failure	Off = PPM 2 functioning Amber = PPM failed or missing (if corresponding processor is installed)
9	Health	Off = Normal (system in standby mode) Green = Normal (system powered on) Amber = System degraded Red = System critical
10	Temperature threshold	Off = Temperature is normal Amber = Temperature threshold exceeded
11	Server Feature Board installation failure	Off = Server Feature Board is installed properly Amber = Server Feature Board is not installed properly
12	System fan failure	Off = Fan is functioning Amber = Fan is not installed or has failed
13	Processor failure 2	Off = Processor 2 functioning Amber = Processor 2 failed
14	Processor 2 thermal	Off = Processor 2 temperature normal Amber = Thermal trip for processor 2 detected. See POST error messages for appropriate instructions.
15	Processor failure 1	Off = Processor 1 functioning Amber = Processor 1 failed or is missing

Network Controller LEDs

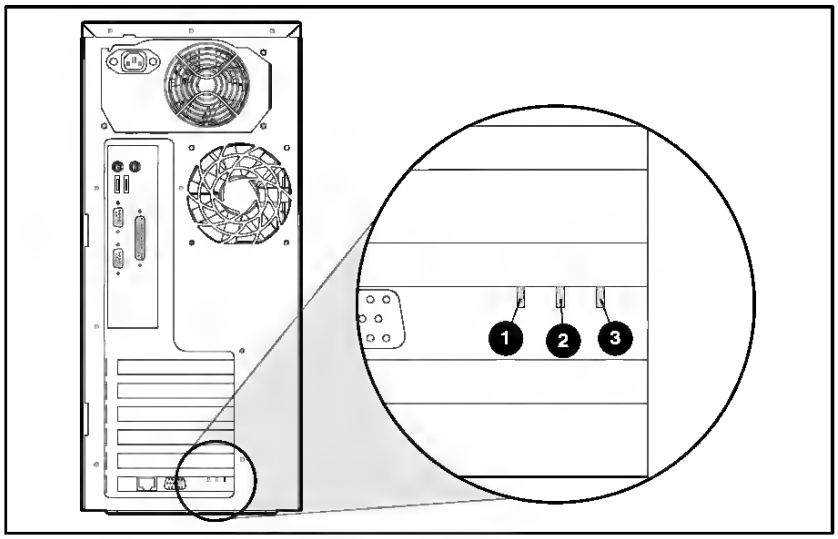

Figure 4-11: Network controller LEDs

Table 4-11: Network Controller LEDs

Item	Description	Status	Condition
1	Network speed LED	Off	10Base-T 10-Mbps (10Base-T Ethernet)
		On	100Base-TX 100-Mbps (100Base-TX Ethernet)
2	Network link LED	Off	No network link
		On	Linked to network
3	Network activity LED	Off	No network activity
		On or flashing	Network activity

5

Physical and Operating Specifications

This chapter provides specifications for the Compaq ProLiant ML330 Generation 2 server. The following specifications are provided:

- System Unit
- Memory
- 1.44-MB Diskette Drive
- IDE CD-ROM Drive
- ATA Hard Drives
- Wide Ultra3 SCSI Hard Drives
- Integrated PCI 10/100 Wake on LAN Network Interface Controller (NIC)
- Integrated Dual-Channel Wide Ultra3 SCSI Controller
- Integrated Dual-Channel ATA 100 Controller

System Unit

Table 5-1: System Unit Specifications

Dimensions	
Height	42.0 cm (16.5 in)
Width	19.1 cm (7.5 in)
Depth	51.5 mm (20.25 in)
Approximate weight	16.16 kg (40 lb) weight approximate, depending upon options
International input requirements (per power supply)	
Rated input voltage	200 VAC to 240 VAC
Rated input frequency	47 Hz to 60 Hz
Rated input current	<6 A RMS at 90 VAC with maximum load
U.S. input requirements	
Rated input voltage	100 VAC to 127 VAC
Rated input frequency	47 Hz to 60 Hz
Rated input current	<6 A RMS at 90 VAC with maximum load
Power supply output power	
Rated steady state power	300 W
Maximum peak power	400 W
Btus for tower model	1,560 Btu/hr
Temperature range*	
Operating	10°C to 35°C (50°F to 93°F)
Nonoperating	-40°C to 66°C (-40°F to 150°F)
Relative humidity (noncondensing)	
Operating	20% to 60%
Nonoperating	5% to 90%
Acoustic noise	
Idle (hard drives spinning)	5.3 NPEL (Bels)/45 AVERAGE SPL (dba)
Operating (random seeks to hard drives)	5.3 NPEL (Bels)/45 AVERAGE SPL (dba)

* All temperature ratings are shown for sea level. There is an altitude derating of 1°C per 300 m to 3,000 m (1.6°F per 1,000 ft to 10,000 ft).

Memory

Table 5-2: Memory Specifications

Size	64 MB, 128 MB, 258 MB, and 512 MB, and 1 GB
Speed	PC 133-MHz
Type	ECC Registered SDRAM DIMMs

1.44-MB Diskette Drive

Table 5-3: 1.44-MB Diskette Drive Specifications

Size	8.89 mm (3.5 in)
LEDs (front panel)	Green
Read/write capacity per diskette (high/low density)	1.44 MB/720 KB
Drives supported	1
Drive height	Third, 1 inch
Drive rotation	300 rpm
Transfer rate bits/sec (high/low)	500 Kbps/250 Kbps
Bytes/sector	512
Sectors per rack (high/low)	18/9
Tracks per side (high/low)	80/80
Access times	
Track-to-track (high/low)	3 ms/6 ms
Average (high/low)	169 ms/94 ms
Settling time	15 ms
Latency average	100 ms
Cylinders (high/low)	80/80
Read/write heads	2

IDE CD-ROM Drive

Table 5-4: IDE CD-ROM Specifications

Applicable disk	CD-ROM (modes 1 and 2); mixed mode (audio and data combined); CD-DA; Photo CD (single- and multiple-session), CD-XA (mode 2, forms 1 and 2); CDI ready; CD-WO
Capacity	650 MB
Rotational speed	5,200 rpm
Block size	2,328 bytes (CD-XA)
	2,340 bytes, 2,338 bytes, 1,024 bytes (mode 2)
	2,048 bytes, 1,024 bytes (mode 1)
	2,352 bytes (CD-DA)
Dimensions	
Height	42.9 mm (1.69 in)
Width	208.0 mm (8.2 in)
Depth	150.1 mm (5.91 in)
Weight	0.950 kg (2.09 lb)
Data transfer rate	
Sustained	150 KBps (single), 1,500 to 4,800 KBps (10X to 32X)
Burst	150 KBps to 4,800 KBps
Interface	IDE (ATAPI)
Access times (typical)	
Full stroke	<150 ms
Random	<100 ms
Diameter	12 cm, 8 cm (4.7 in, 3.15 in)
Center hole	15 mm (0.6 in)
Thickness	1.2 mm (0.05 in)
Track pitch	1.6 µm
Cache/buffer	128 KB
Startup time	<7 seconds
Stop time	<4 seconds

continued

Table 5-4: IDE CD-ROM Specifications *continued*

Laser parameters	
Type	Semiconductor Laser GaA1As
Wave length	780 ± 25 nm
Divergence angle	53.5° ± 1.5°
Output power	0.14 mW
Operating conditions	
Temperature	5°C to 45°C (41°F to 113°F)
Humidity	5% to 90% (10% to 80%)

ATA Hard Drives

Table 5-5: ATA Hard Drive Specifications

Description	20 GB 7.2K rpm	40 GB 7.2K rpm
Capacity	20,020.0 MB	40,020.0 MB
Height	25.4 mm (1 in)	25.4 mm (1 in)
Width	101.8 mm (4 in)	101.6 mm (4 in)
Interface	Ultra ATA/100	Ultra ATA/100
Transfer rate synchronous (max)	100 MBps	100 MBps
Seek time (typical, including setting)		
Single track	1.2 ms	1.2 ms
Average	<8.55 ms	<8.55 ms
Full stroke	<20.0 ms	<20.0 ms
Rotational speed	7,200 rpm	7,200 rpm
Physical configuration		
Logical blocks	39,102,336	78,165,360
Bytes/sector	512	512
Operating temperature		
Celsius	10° to 35°	10° to 35°
Fahrenheit	59° to 95°	59° to 95°

Wide Ultra3 SCSI Hard Drives

Table 5-6: Wide Ultra3 SCSI Hard Drive Specifications

Description	18.2 GB 10 K rpm	36.4 GB 10 K rpm
Capacity	18,209.3 MB	18,209.3 MB
Height	25.4 mm (1 in)	25.4 mm (1 in)
Width	101.6 mm (4.0 in)	101.6 mm (4.0 in)
Interface	Wide Ultra3 SCSI	Wide Ultra3 SCSI
Transfer rate synchronous (max)	160 MBps	160 MBps
Seek time (typical, including setting)		
Single track	0.9 ms	0.9 ms
Average	5.5 ms	5.7 ms
Full stroke	12.0 ms	13.0 ms
Rotational speed	10,000 rpm	10,000 rpm
Physical configuration		
Bytes/sector	512	512
Logical blocks	35,565,080	71,132,000
Operating temperature		
Celsius	10° to 35°	10° to 35°
Fahrenheit	59° to 95°	59° to 95°

Integrated 10/100 Wake on LAN Network Interface Controller

Table 5-7: Integrated 10/100 Wake on LAN NIC Specifications

Network interface	10Base-T/100Base-TX
Compatibility	IEEE 802.2, 802.3, 802.3u
Data transfer method	32-bit, PC 33-MHz bus master
Network transfer rate	10/100 Mbps
Connector	RJ-45
I/O address and interrupt	Plug and Play PCI
Compliance	PCI 2.2 and 2.1
OS support	For specific OS support, refer to: www.compaq.com

Integrated Dual-Channel Wide Ultra3 SCSI Controller

Table 5-8: Integrated Dual-Channel Wide Ultra3 SCSI Controller Specifications

Protocol	Wide Ultra3 SCSI, Wide Ultra SCSI, Fast-Wide SCSI-2, and Fast SCSI-2
Compatibility	All PCI server configurations are backward compatible with Fast, Fast-Wide SCSI-2, Wide Ultra2 SCSI, and Wide Ultra3 SCSI devices
Drives supported	Up to 15 SCSI devices per channel
Data transfer method	32-bit PCI bus master
Maximum transfer rate per PCI bus (peak)	133 MBps
SCSI channel transfer rate	160 MBps
SCSI termination	Active termination
SCSI connectors	2 internal (68-pin)
Capacity	509.6 GB
Height	1.0 in
Size	3.5 in
Interface	Wide Ultra3 SCSI
Seek time	
Single track	0.8 ms
Average	7.9 ms
Full stroke	17.0 ms
Rotational speed	7,200 rpm
Physical configuration	
Bytes/sector	512
Logical blocks	17,773,524
Operating temperature	10°C to 35°C (50°F to 95°F)

Integrated Dual-Channel Ultra ATA 100 Controller

Table 5-9: Integrated Dual-Channel Ultra ATA 100 Controller Specifications

Protocol	UDMA Mode (0-5) PIO Mode (0-4)
Drives supported	Up to 4 ATA (2 devices per channel)
Data transfer method	32-bit/33-MHz PCI bus-master
Maximum transfer rate per PCI Bus (peak)	133 MBps per channel
ATA 100 Cable	80-conductor cable
ATA channel transfer rate	100 MBps per channel
ATA connectors	Two 40-pin connectors (primary and secondary)

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